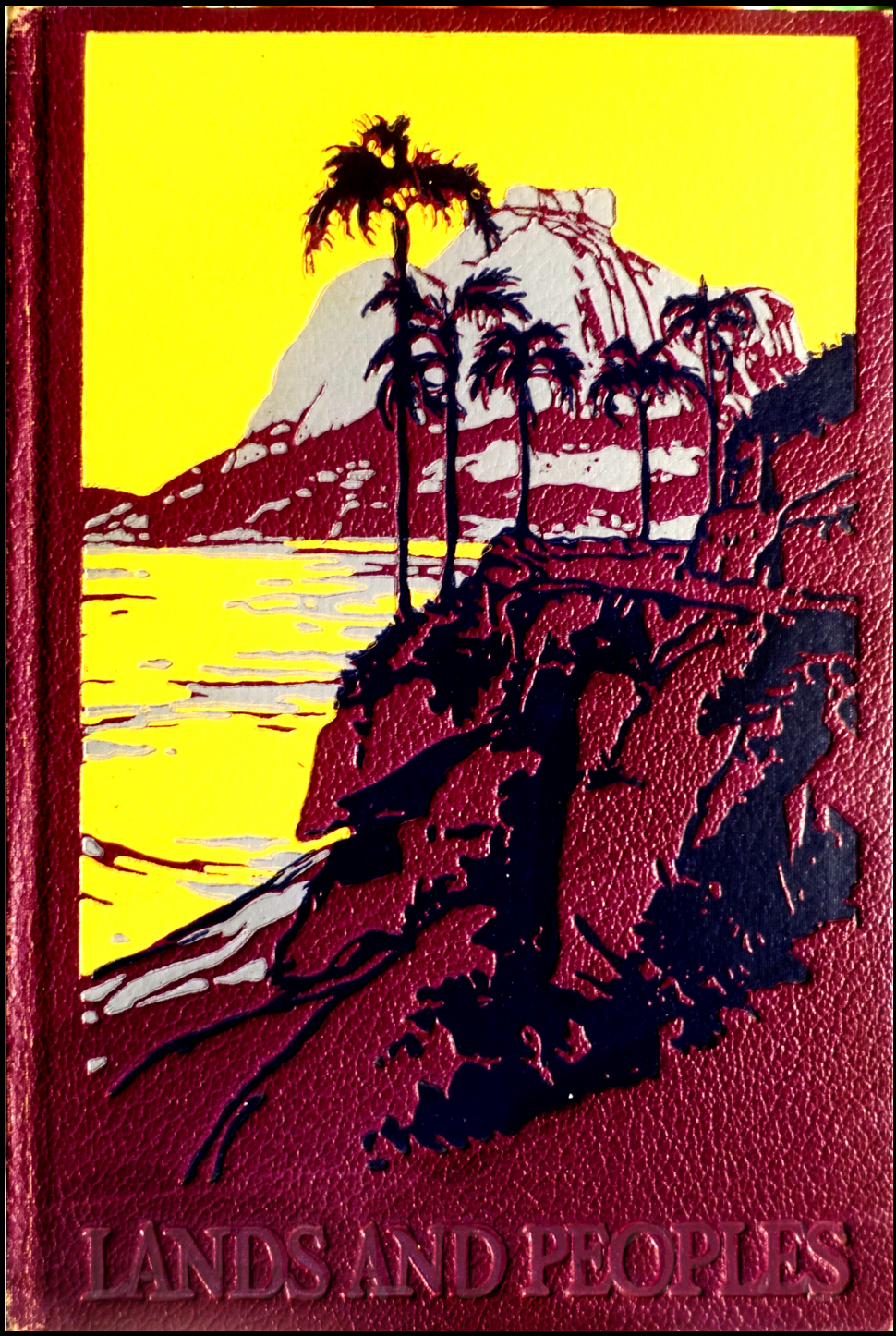

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and a chapter on

THE FRIENDLY NORTH

by the explorer

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THE GREAT CATHEDRAL FACING THE PLAZA DE LA CONSTITUCIÓN IN MÉXICO CITY

The Plaza is not only the centre of México City, but a spot full of historic interest, for the Aztec priests used to offer human sacrifices just where the Cathedral now stands. The great church was over two hundred years in the building and although despoiled of many jewels and treasures by war-time plunderers is still a lavishly rich and beautiful shrine. The domed building on the right is the National Palace, containing a museum in which are preserved the idol of the Aztec war god and the curiously carved sacrificial stone from the ancient temple.

MARVELOUS MEXICO

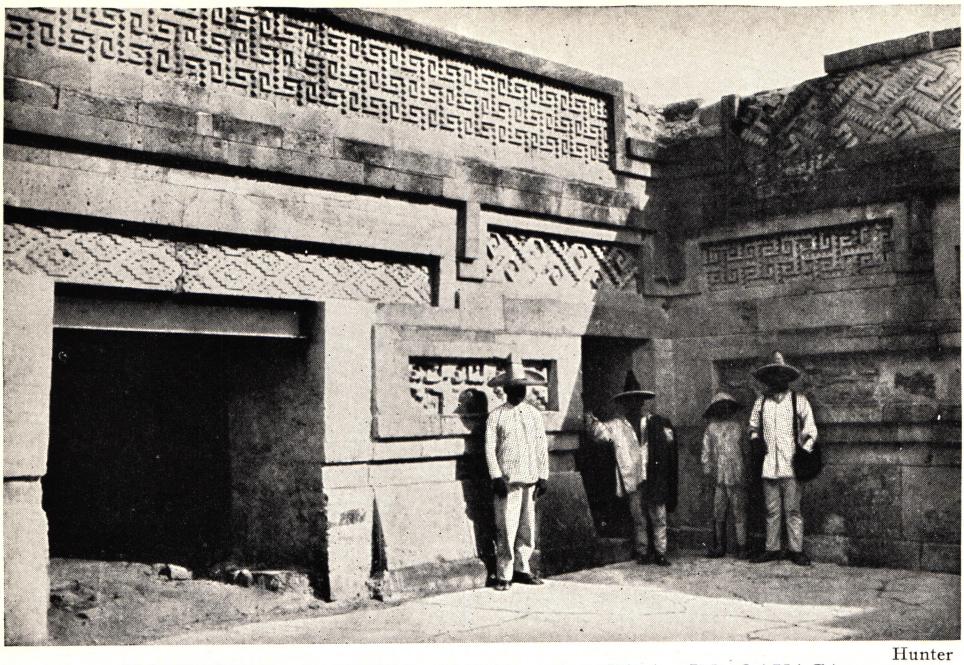
Contrast and Color in an Ancient Indian Land

The Republic of México lies half in the tropics, and its climate varies amazingly, from the dry cactus plains along the Rio Grande to the rank jungles on the Guatemalan border. Though a very mountainous country, it is surprisingly fertile, and can produce crops as different as wheat and rubber. No land is more splendidly endowed with mineral wealth. Cortés and his Spanish adventurers came to México for gold; they found plenty of it, and silver in far greater abundance. To-day the fortune-hunters drill for oil along the Gulf of México, and often acquire wealth only less fabulous than that of the Aztecs whom Cortés despoiled. As a republic México is not much more than a hundred years old, and there are still serious problems to be solved before the Indian and Spanish elements of her population can be welded into a true democracy.

MÉXICO is a land of strange extremes, where dirt and cleanliness, poverty and riches, ignorance and culture are to be found side by side. The very landscape is rich in contrast, for the variation in altitude of this half-tropical country is so great that the soil will produce every fruit grown between the Arctic Circle and the Equator. In the low valleys one finds wide fields of sugar-cane, and on the mountain slopes fields of wheat. The mining country is very broken and rocky, with scarcely a sign of vegetation. There are dense jungles in the south, and vast cattle ranges in the arid northern regions. Both the Pacific coast and the shores of the Gulf of México are hot and sandy, but inland rises a great plateau five thousand feet high, spotted with lakes large and small, and topped by snowy volcanoes. Only two mountains on the continent are higher than Orizaba, which measures well over 18,000 feet. México had in ancient times a remarkable civilization. It possesses amazing ruins of temples, tombs and palaces, and pyramids that rival those of Egypt. Essentially an Indian land, it represents a combination of that ancient culture and the European civilization which the Spaniards brought. Added to these elements is the influence of present-day industrial life, so that modern México presents an extraordinarily interesting picture.

Before the Spanish conquest, northern México was inhabited by pueblo Indians like the tribes of Arizona and New México. In Yucatán the Mayas from Guatemala built many great cities, of which the most famous was Chichen Itzá, founded in the sixth century. Its terraced temples and colonnades are ornamented with boldly carved sculptures and strange hieroglyphics. The Mayas kept manuscript records too, and developed a literature. They were skilled craftsmen and accurate astronomers. Different tribes in turn occupied the Valley of México on the central plateau, or mesa. Among the earliest were the Toltecs, whose great buildings remain to baffle archæologists. At San Juan Teotihuacán near México City are colossal pyramids and temples, ruins of a great city which may well have existed before the Toltecs. The Aztecs later became rulers of the tableland, absorbing much of the earlier culture. The chief defect of their elaborate, organized civilization was a body of religious principles based on human sacrifice. But they were handicapped in two other ways. They had no beasts of burden, and they did not know how to smelt iron, though they used gold, silver, bronze and stone very skillfully, while their feather-work was surpassingly beautiful.

When Hernando Cortés landed near Vera Cruz in 1519 he had less than seven hundred soldiers, and it is amazing to learn that such a handful could overthrow the powerful Aztec empire. But the invaders were greedy for gold, and had



Hunter

WONDERFUL ZAPOTEC RUINS AT MITLA, IN OAXACA

The Zapotecs lived between the Toltecs and the Mayas and were influenced by both. Their palaces are built of soft volcanic rock which hardens when exposed to air. Some of the huge slabs are twenty feet long, and, like the million tiny pieces in the mosaic decorations, were cut with stone tools and placed by hand.

heard tempting tales of México's wealth. Moreover they were desperate, for Cortés had scuttled his ships behind him. He had horses and firearms, and the natives thought he was a god. Then, too, the Indians were divided among themselves; some of the tribes hated their despotic emperor, Montezuma, and so Cortés found allies who helped him reach México City. Montezuma himself was afraid of the Spaniards, and Cortés boldly captured him. At that the empire began to crumble. After a few years of fierce cruel fighting the rich country was conquered and plundered, México became the colony of New Spain, and the barbaric splendor of the Aztecs disappeared.

The early priests and friars worked untiringly to Christianize and educate the Indians; there is scarcely a village which does not have its ancient, crumbling Spanish church, for nine thousand were built during the colonial period. In fact more churches were built than the people could afford, and the Indians were not very well off. They had to labor in the silver and gold mines and they lived under miserable conditions, for the Spanish rulers were more interested in enriching the mother country than in caring for the welfare of the people. Even the creoles, the Spaniards born in México, felt themselves mistreated by the government. There was already much discontent in the country when the ideas of the French Revolution and Napoleon's conquest of Spain broke up the Spanish Empire.

The first two revolutionary outbursts in New Spain were led by priests, Hidalgo and Morelos, and came to nothing. But in 1822 the colony achieved independence and Augustín de Iturbide was chosen emperor; he ruled less than a year before a republic was proclaimed. Then began a tumultuous period for México. Different generals fought for power, and none succeeded in keeping it long. From 1829 to 1862 the republic had fifty presidents. The great state of Texas seceded from the Mexican union in 1836, and joined the United States nine years later. That brought on the Mexican War, in

which México lost a vast stretch of territory north of the Río Grande. Then French troops, which had landed under pretense of collecting debts, overthrew the republic and had Archduke Maximilian of Austria proclaimed emperor, but as soon as the French soldiers left, Maximilian was deposed and executed.

Next General Porfirio Díaz became dictator and stayed in power until 1911. His strong rule was beneficial in many ways, after the long years of turmoil and violence. He maintained order at all costs, and soon foreign capitalists ventured to lend money to the government, to build railroads and invest in mining properties. But eventually signs of discontent began to appear. There was dissatisfaction over the way land was concentrated in large estates, so that the peasants were forced to work for the great landowners at starvation wages. Many people thought Díaz too autocratic, and more solicitous for the interests of foreigners than for those of his own people. Revolution broke out, and he resigned.

Almost ever since, México has been torn by rival factions. The disorder has occasioned serious disputes with the United States, and the new constitution adopted in 1917 is disliked by foreigners on account of its petroleum clauses. It also restricts greatly the power of the Church, and so has caused hostility between many Catholics and the government. The whole story of the Revolution is confusing and often disheartening. One president or dictator followed another, and some of the men who fought their way to the presidency were assassinated. Since 1924, the revolutionary government has maintained itself in spite of attempts against it, so it is now hoped that México is losing the habit of per-

C. Mabor Hodgess

THE MARIMBA IS A SMALL ORCHESTRA IN ITSELF

Music is a passion with the Mexicans, and every town plaza has its bandstand for evening concerts. The marimba is a more primitive instrument than the brasses used in band concerts, but when skillfully played it is exceedingly effective. The wooden sound boxes give resonance to the tones produced by striking the strips of hardwood.

© E. N. A.

ON THE GREAT MESA THE CACTUS GROWS EVERYWHERE

The strange silhouettes of many different cactus plants are a part of the Mexican landscape. To the peons the cactus is a godsend; it provides some shade for their thatched huts, and hedges of the organ variety line the village roads. From the prickly leaves they get fruit which they call "tunas"—little round cool globules, like jelly inside.

petual revolts, and entering on a new era of development. Recently the Church and the government have been attempting to reconcile their differences, but the church is still unwilling to accept the legal restrictions upon its activities.

The majority of the people are Indians and mestizos, which indicates the importance of the Indian inheritance. The Indians are a short, sturdy race with rich golden-brown skin, very thick black hair, bright black eyes and strong white teeth. There are many different tribes, with varying characteristics. Some are excitable, others sullen and moody; all are strong and patient, and on the whole unresponsive to strangers and alien institutions. That is one reason why it is so difficult to organize a really democratic government in México: the millions of illiterate peasants do not understand the idea. They have always done as they were told. They are content to live in their mud and thatch huts, weaving blankets, making pottery, or cultivating a bit of ground for a living, just as they did when Montezuma was emperor. They live in constant terror of outlaws, and of revolutionary troops who may press men into service, or loot and destroy a village because it has supported the government army. So the poor Indians find it safest to keep out of sight when possible, and say nothing. Government to them usually means something to fear. With wise administration perhaps this will no longer be the case; even now there are signs of encouragement. The new land laws are giving the peon a chance to make a living on his own land, and some tribes show great promise. For example, the Zapotecs are stimulated by the memory of their great leader, Benito Juárez, who as President accomplished many reforms, and they should play a large part in the country's development. Most Mexican Indians possess musical and artistic talent. Bright colors are a passion with them, and the great painters of México to-day all reflect Indian genius and spirit.

© Topical

PEDDLING FIREWOOD IN A MEXICAN STREET

Wood and charcoal are the two fuels most used in Mexican homes, for furnace fires are unknown in this mild climate. Many houses have no chimneys even, for charcoal makes little smoke. This peddler, with his bright black eyes and Indian features, looks too small for his load, but the Mexican peon is wiry and strong, if not very tall.

Powell-Jones

HORSEMEN ON THE ROAD, NOT FAR FROM MÉXICO CITY

Were it not for the riders with their blankets and wide sombreros, this road and the pine woods might almost be mistaken for some spot in the United States—New England, or northern Pennsylvania. But although the climate on the high plateau of México is cool enough for evergreens, the sun is evidently warm, for two of the men are mopping their faces.

Powell-Jones

A FEAST DAY IN THE PRETTY LITTLE TOWN OF SAN ANTONE

In this sunny climate almost every peon wears a white cotton suit, and throws a blanket or serape over his shoulders to keep out the chilly morning air of the high plateau. Mexican peons still cling to some of their ancient Indian beliefs, but are nevertheless very devout Catholics and observe many holidays. The famous Cuernavaca pottery is made in San Antone.

© Underwood & Underwood

MEXICAN CABALLERO IN GALA DRESS

This gentleman is a rancher come to town to display his beautiful horse. He wears his best sombrero, and the braid on his jacket is silver, like the coins down the seams of his tight trousers. His big silver spurs do not show.

The large mestizo class, which has resulted from the mingling of Spanish and Indian blood, is rapidly becoming the dominant Mexican type. It is the mestizo to whom we refer when we speak of the "average Mexican"—whether he be peon or wealthy rancher. This every-day Mexican is a very contented and sometimes lazy being. Nothing seems to him so important that it cannot be put off till to-morrow. Yet he has decided ability, and it is he, more than anyone else, who is making the modern México.

Many mestizos are cattle-men —cowboys and small ranchers. Millions of acres are devoted to stock farms, from Coahuila on the Texas border to Yucatán in the south. Most of the cattle, horses, sheep and goats have been bred from those introduced by the Spaniards long ago. The cowboy, or vaquero, is a striking figure on his wiry little pony. He uses a cumbersome wooden saddle and large stirrups, wears enormous spurs and an immense, overshadowing sombrero. When he comes into town from the hacienda, he dresses up magnificently and rides his best horse.

The word "hacienda" means an estate and its dwelling-house and buildings. Some haciendas are very big and on them thousands of peons, or laborers, may be housed; but the housing problem does not trouble the Mexican overmuch. A brick hut fifteen feet square is often thought adequate for a family of peons, no matter how numerous they may be. Little furniture is required, for they live chiefly out of doors and sleep not on beds but on palm-leaf mats. All around the buildings are the plantations which furnish food for the establishment, and beyond stretch the grazing grounds, mile upon mile.

But there is also a Spanish background. The language is Spanish; the architecture of churches and city houses is reminiscent of Spain, as are the popularity of bull fights and many little customs such as the strict chaperonage of upper-class women. In the old cities of the provinces—Puebla, or Oaxaca—lovely girls still wear lace mantillas and high combs, and never go out unaccompanied by an older woman. The Mexican of Spanish blood is ceremonious, proud and polite, with a flair for the arts. He is intellectual, has the Latin sense of culture and enthusiasm for ideas, but lacks great practical energy.

An amazing variety of crops will grow

© E. N. A.

FRUIT-SELLER IN THE MARKET PLACE OF AGUASCALIENTES

"Aguascalientes" is Spanish for hot springs, and this name has been given to a city and a state of México because of the medicinal springs there. One may bathe in clear blue running water of any temperature, and the public baths are always crowded. Aguascalientes is a sunny town of low bright-painted houses, famous for its pottery and its linen drawn-work.

© Cutler

TEHUANA WOMAN IN NATIVE COSTUME

The Indians on the Isthmus of Tehuantepec, in the Mexican tropics, are remarkable for grace and good looks, and the women hold a much better position than those of other tribes. The headdress is made of frilled lace.

in different parts of México, and there is really but one limit to the agricultural development possible. That is the amount of money available for farm machinery and irrigation purposes. Water is very scarce on the mesa, and irrigation works are expensive. But the most arid, dusty and unpromising stretch of land, where nothing thrives except cactus and coarse grass, may be transformed by water into fertile fields of cotton, sugar, wheat or corn.

Corn grows everywhere, and is the chief food of the people. They bake flat tortillas or "pancakes" of corn bread, with which they eat brown beans and meat stew highly seasoned with chili peppers. Tamales are pieces of pork or chicken encased in ground corn, and wrapped in corn husks while they cook. Wheat bread is unusual, for wheat can only be grown in the cooler mountainous districts. Coffee, cacao and tobacco thrive on the slopes of the great plateau, while in the lowlands are cotton fields, rice plots, green seas of sugar-cane, and even rubber plantations. Products as different as alfalfa and vanilla are increasingly important. The maguey plant furnishes the peon with a variety of products: thatch for his hut, fibre for twine, molasses, vinegar, and pulque, a fermented liquor similar to beer.

The government is trying to encourage the small farmer. Since the Revolution, there has been a limit to the number of acres one man may own, and the surplus from huge old estates is being divided among peons, and among villages which used to own plots of land in common.

Peonage was little different from slavery, since the laborers always owed money at the hacienda store, and were not allowed to leave their master when they were in debt to him. If they labored in the mines, their lot was still more miserable. They were worked to the limit, and callously kept underground in the terrible heat for long hours. Sometimes, in desperation, the Indians flooded the mines or set fire to the wooden shoring, thus causing a cave-in and killing themselves. To-day Americans own most of the mines and have introduced modern machinery, so that the rocky valleys about Guanajuato and Pachuca resound with the noise of stamp mills. Down in the shafts peon labor is as indispensable as ever, but since the Revolution and the organization of labor unions, working conditions are better.

México produces about a third of the world's silver supply, and the value of the

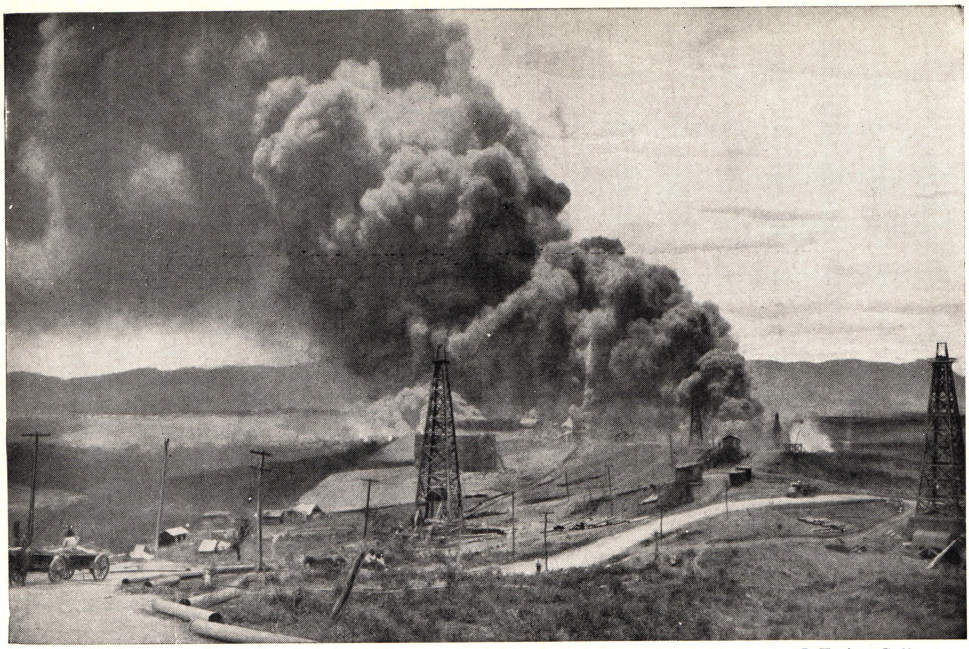
A. Glint

ANY DAY IS WASH DAY IN THIS CONVENTILLO

A "conventillo" is the Mexican equivalent for a tenement house. México City is badly over-crowded in the poorer sections, so that peons live in very close quarters. Every dark little room around this patio houses a whole family, and the women are lucky to have a place in which to do the wash. Water has to be brought from the fountain in the street.

metals taken from her mines in the last four hundred years is estimated at five billion dollars. The state of Zacatecas alone produces silver to the value of several millions every year. Chihuahua is richer yet. Often silver is found mixed with other metals. In the mines of San Luis Potosí gold, silver and lead are intermingled. Gold is rarely found alone, and there is much less of it. Lower California, that long, narrow, arid peninsula off the west coast, is a gold-mining state. Sonora, on the Arizona border, has great deposits of copper. There are useful metals like manganese and mercury, and precious stones—opals, turquoises, amethysts, emeralds. Iron is abundant in Oaxaca and Vera Cruz, but Durango possesses a great iron mountain, the Cerro del Mercado. Its contents have been estimated at five hundred million tons, and the ore tests almost 70 per cent pure. Anthracite coal, unfortunately, is scarce in proportion, and the lack of it hinders industrial development. But hydro-electricity can be used in default of steam power, and México has great water power resources. The cotton mills of delightful Guadalajara, for instance, are run by current generated at the falls of Juanacatlán near by. Textile mills head the list of Mexican manufacturing plants, and the factory system is gaining ground, which affects somewhat the traditional hand industries. As it increases in extent, it brings with it new labor problems to solve.

The greatest single industry, the one which gets more publicity, offers more quick fortunes and causes more trouble than any other, is oil. The great fields of Tamaulipas and Vera Cruz have all been developed since 1901. By 1925 the region



© Ewing Galloway

A BLAZING PETROLEUM WELL IN THE STATE OF VERA CRUZ

Petroleum is one of the principal sources of Mexican wealth and it is found all along the Gulf coast. The Amatlan oil fields shown here are in the state of Vera Cruz. When a gusher is struck, the fire menace is very great. One well, the Dos Bocas, burned for two months, consuming one hundred thousand barrels of oil every day before it was put out.

had produced 1,343,693,000 barrels of oil. The peak year was 1921, when production reached 193,397,000 barrels. Since that year, many wells have ceased to flow and production has decreased steadily. Although much oil land remains to be developed, it is likely that the process will in the future be less spectacular.

Tampico is the great oil port, but almost every other Mexican product passes through historic Vera Cruz, the key to México ever since Cortés sailed into its harbor. Pirates of the Caribbean always kept a hopeful eye on Vera Cruz, for the Mexican ships of the annual treasure fleet sailed from there for Spain. It is on the edge of the Mexican tropics. A little further south at the Isthmus of Tehuantepec, where less than two hundred miles separates the Atlantic from the Pacific, the Trans-Isthmian railroad cuts its way through veritable jungle. Swamps and forests shelter deadly snakes, jaguars, alligators, parrots and gaily colored birds of all kinds.

Very different from Tehuantepec is México City. The capital has a location unsurpassed for beauty, pleasant climate and romantic interest. It lies in a valley seventy-five hundred feet above the Gulf, with volcanoes on all sides. When the Aztecs migrated there, most of the valley was under water and they built their city on small islands in the lake. By now the big lake has been partly drained, leaving six smaller ones. Low, solid masonry houses stretch out over twenty square miles of this reclaimed land, and shelter nearly a million people. Skyscrapers are conspicuous by their absence, but in speedy transportation and high prices México City almost outdoes New York. Taxis, trucks and private cars race past each other along the Avenida de Francisco I. Madero, where all the expensive shops are located. The city's most beautiful street, the Paseo de la Reforma, was laid out by the unfortunate Emperor Maximilian. Bordered with a double row of trees, it extends straight to Chapultepec Park on the outskirts. Maximilian and his wife Carlotta also helped to restore and em-

© Underwood & Underwood

QUEER PLANT FROM WHOSE LEAVES ROPE-FIBRE IS MADE

In Yucatán the henequén plantations cover acres of dry soil. The long spiked leaves furnish a fibre called sisal hemp which is exported to the United States in huge quantities and used to make rope and twine. Ropes of sisal withstand dampness better than those made from ordinary hemp. The plant is an agave, one of many species which flourish in México.

Corona

MULES BRINGING BAULKS OF MAHOGANY FROM THE FOREST

The great forests of México produce cabinet woods, dyewoods and building timber. From the lowland jungles come mahogany and rosewood, from the high mountain slopes, pine, oak and chestnut. The forests are estimated to cover twenty million acres. The low thick jungles of the Yucatán peninsula furnish chicle for the chewing gum sold in the United States.

JONES

MÉXICO'S MOST BEAUTIFUL VOLCANO is Popocatepetl, dominating the great Valley of México. This view across the green cornfields was taken from the old Spanish church in the village of Ozumba. About forty miles north of the volcano is México City, among the lakes which dot the lovely valley. "Popocatepetl" means "Smoking Mountain." Aztec legend says that Old Popo was a god, and the neighboring volcano of Ixtaccihuatl was "The White Woman," his wife. Snowy Popocatepetl is nearly 18,000 feet high, and Ixtaccihuatl but a little lower.

POWELL-JONES

THIS OLD SPANISH WATER-TOWER is near Los Remedios, and the aqueduct carries water to a neighboring town. In the cities, modern systems have taken the place of the water-works built by the Spaniards long ago. So much of México is dry and mountainous, with no rain for months at a time, that it is most necessary to ensure a steady water supply. The soil is very fertile, but without water only desert plants such as the cactus and the maguey will grow. The maguey, as we can see here, has queer, stiff leaves like spikes.

Publishers Photo Service

A PEON BABY VIEWS THE WORLD

This woman is very poor, but her black-eyed baby looks unusually well cared for. Most peon youngsters scramble about without clothes until half-grown. The mother's blue rebosa is worn as inevitably as a man's sombrero.

bellish the Palace of Chapultepec, which stands on a high rock in the midst of the cypress park. It is now the home of the President, and from its tiled porches one may look back over the city, over flat house roofs and tall church towers, to the green valley, bright lakes and snow-covered mountains beyond. The two greatest volcanoes of all are the twin peaks, Popocatepetl and Ixtaccihuatl.

The Plaza de la Constitución was the heart of the city in Aztec days, as now. On one side is the National Palace, and the great Cathedral stands on the spot where Montezuma's priests offered sacrifice to the fearful god of war. Cortés tore down the temple when he sacked the Aztec city, and in its place rise the twin towers of the largest and oldest church in North America.

The plaza itself looks modern. Lines of street cars discharge passengers from the residential districts; men in ordinary business suits are more numerous than hacendados in riding costume; we see as many Paris frocks as mantillas. But always there are the peons, dressed in rags or white cotton suits as the case may be, the men wearing bright blankets and the women wrapped in dark shawls called rebosas. Many come in from the countryside to work as servants in the massive stone houses which line the better streets. It is customary to employ three or four servants in quite small households, and as many as forty in large ones. The Mexican servant cannot be induced to do anything except his or her own particular job. If we were to ask the doorman to scrub the floor or the cook to make the beds, we should probably be told "No es costumbre" (It is not the custom). The housekeeper does the marketing, and a shrewd bargainer she is.

Peons go to market not so much to buy and sell as to talk and bargain and enjoy themselves in so doing. Hence the markets are a great feature of the country, and whole families come in to a market town along the dusty roads from the hills. They bring graceful earthenware jars, palm-leaf mats and reed baskets; the panniers on their little donkeys carry wood and charcoal, tomatoes, corn and eggs. The market building becomes a colorful jumble of people and merchandise. Around a pool of water in the middle the flower-women display their bright nosegays. These people have a passionate joy in flowers. There are exotic tropical blooms—orchids in profusion, and madonna lilies—and flowers familiar in cooler countries—marigolds, pinks, blue larkspur and roses of all colors, yellow poppies, pansies and heliotrope.

We may buy produce—fruits, vegetables, poultry—or hand-manufactured

Powell-Jones

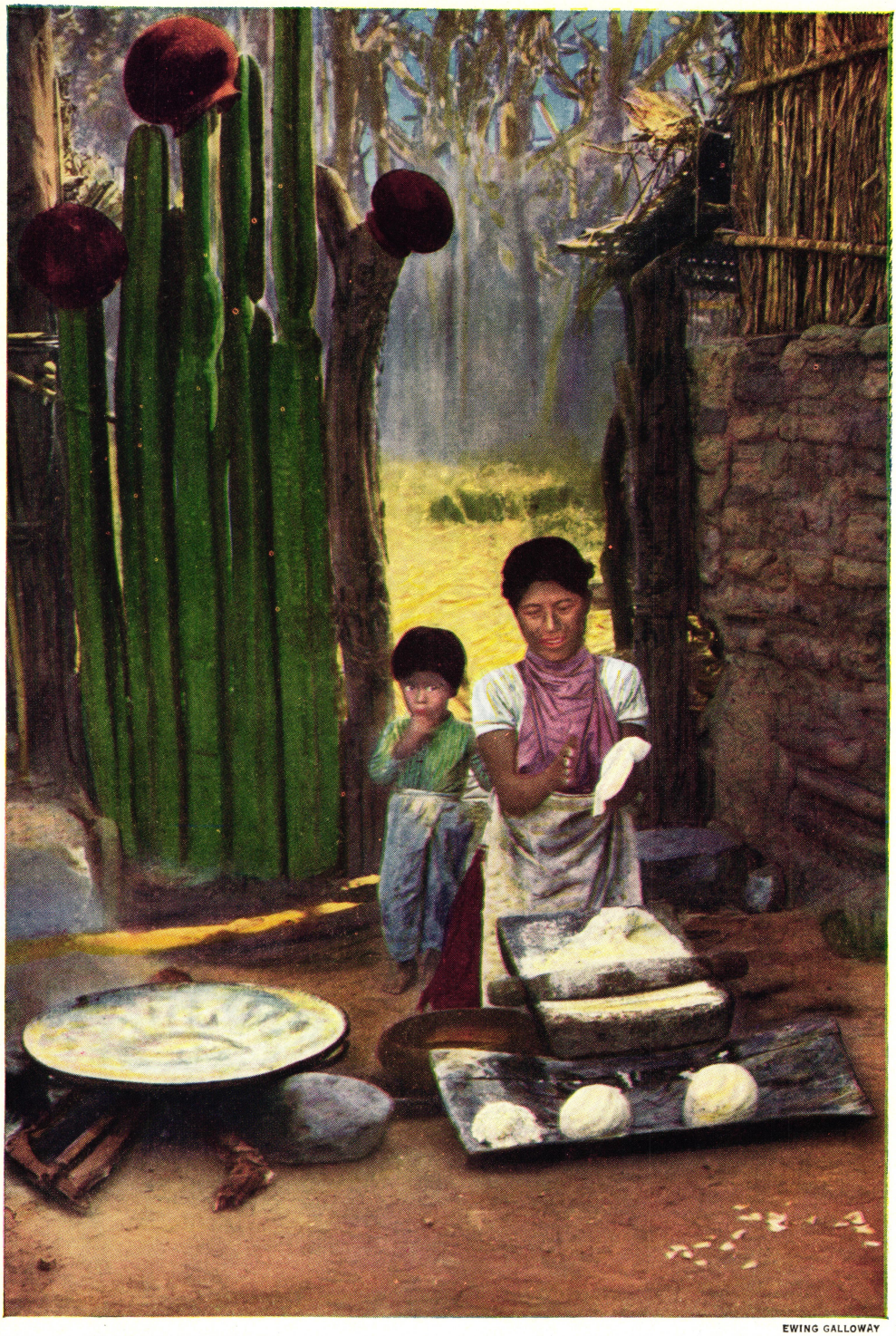
CLUTTERED DOORYARD OF A MEXICAN POTTER'S HOME

Pottery was a fine art in prehistoric México, and the Spanish priests encouraged it. They taught the Indians how to make different kinds of earthenware. The state of Puebla is noted for its tiles, and Guadalajara for its water-jars. With very simple tools this man makes graceful jars and dishes of all shapes, and bakes them in the round kiln.

Corona

FRUIT FROM LAKE XOCHIMILCO FOR THE MARKETS OF MÉXICO CITY

The "floating islands" of Lake Xochimilco are garden patches separated by canals. Once they actually floated, being rafts of tree trunks covered with soil and anchored in shallow water. Through the years enough silt has collected to change them into real islands, where grow flowers, fruits and vegetables. Canoes and pleasure boats crowd the canals.



EWING GALLOWAY

MAKING TORTILLAS is the perennial job of this Indian woman, and she spends hours grinding corn between the two stones in front of her. When the dough is finally ready, she skillfully shapes it with her hands into thin flat cakes, which she bakes on the griddle while Juan watches hungrily and wishes that the tortillas were already done.

BURTON HOLMES FROM EWING GALLOWAY

GAY SERAPES AND WIDE SOMBREROS add color to the crowded scene on a México City street when country Indians come in to town. The serape is a woolen blanket with a slit in the middle which turns it into a highly useful garment. Some Mexican sombreros are of heavy felt or plush and cost as much as forty dollars. These Indians wear cheaper ones woven of straw but none the less precious in their owners' eyes, for his sombrero is enormously important to a peon's happiness and the poorest man wears the best one he can afford.

articles. Pottery, leather-work and weaving are ancient trades. The leather-maker will fit a pair of sandals while we wait. His whole stock-in-trade is very simple, consisting of some scraps of leather, a few thongs, and a sharp curved knife. Down another aisle are piles of the bright-patterned serapes, or blankets, and next the high-crowned hats—the sombreros.

Through the crowd wanders the water-carrier, a very important personage in arid parts of the land. The candy-man walks about carrying his tray on his head, proclaiming his wares in a monotonous song that varies as little as his toothsome stock. Another busy person is the letter-writer, with ink-pot and pen on a small table, who is always willing and eager to write a letter of any description. He symbolizes one of México's great problems—education.

As long as a majority of the people remain illiterate and ignorant, military dictators and unscrupulous politicians will be able to prevent the growth of real self-government. Fortunately the importance of promoting education is realized, and the government is founding schools as fast as possible. It pays the teacher, and the men of the village build the schoolhouse. Almost always the Indians welcome the chance to learn, and children come to school when there is one. The new agricultural schools should exert great influence in the rural districts, for they teach the Indian how to make his land more productive and his crops more profitable. Once education becomes widespread and the millions of people begin to take an active, intelligent part in their country's development, México will be a very great country.

MÉXICO: FACTS AND FIGURES

THE COUNTRY

Bounded north by the United States, west by the Pacific Ocean, south by the Pacific, Guatemala and British Honduras, east by the Caribbean Sea and the Gulf of México. Area, 767,198 square miles. Population (1930), 16,404,030, 15% of which were white, 22% Indian and 55% mestizo.

GOVERNMENT

By the Constitution of 1917, a federated republic (*República Méxicana*) of 28 states, 2 territories and Federal District. National Congress of 2 houses; the members elected for 2 years by universal suffrage. President elected for 6 years and assisted by 10 ministers.

COMMERCE AND INDUSTRIES

Agriculture, mining and stock-raising the chief industries. 30,027,500 acres (one-fourth of arable land available) under cultivation; much irrigation necessary; at close of 1929, 15,228,964 acres had been redistributed as part of the agrarian reform. Chief crops: corn, wheat, barley, beans, sugar, rice, chick-peas, tomatoes and other winter vegetables for United States consumption; coffee, cotton, bananas, henequén, vanilla, tobacco, alfalfa. Plantation and Guayule rubber more important than wild rubber. Most important forest product, chicle from Yucatán and Quintana Roo; 43,933,000 acres of forests. Livestock numbered 19,091,524 in 1929. México produced 108,703,000 troy ounces of silver and 617,000 troy ounces of gold in 1929; copper, 86,554 metric tons; lead, 248,701 metric tons; zinc, 174,050 metric tons. Petroleum production in 1930, 39,600,000 barrels; the situation created by the Petroleum Law of 1925 was improved in 1927 by a more liberal law amending the main points to which foreign oil companies objected. Imports: flour, lard and other foodstuffs, mineral oils, shoes, textiles, iron and steel, building timber, machinery, tools, railroad equipment, automobiles, chemicals. Exports: silver, lead, copper, zinc, petroleum, henequén, cotton, coffee, vegetables, chicle. Manufactures: textiles, tobacco, glassware, leather-work.

COMMUNICATIONS

Main ports, Vera Cruz and Tampico on Gulf of México. Railway mileage, 19,086, mostly state-owned. Federal telegraph and telephone lines, 23,359 miles; other lines, 17,010; 24 wireless stations in 1929.

RELIGION AND EDUCATION

Church and state separate and all religions tolerated. Catholicism well-nigh universal; priests are named by the bishops and must register with the government in order to be licensed. No ecclesiastical body can hold landed property.

Education free, secular and compulsory, and slowly making headway. Since 1924, 3,392 new rural schools with 4,445 teachers have been established, with 170,000 children and 50,000 adults in attendance; also 7 new agricultural schools. Besides federal, state, municipal and private elementary and secondary schools, there are 3 universities and over 235 special schools.

CHIEF TOWNS

México, the capital, 968,443; Guadalajara, 143,376; Puebla, 95,535; Monterey, 88,458; Mérida, 79,225; San Luis Potosí, 57,353.

THROUGH SIX REPUBLICS

Mixed Races and Tropical Lands of Central America

Long before Columbus sighted the coast of Honduras in 1502, or Balboa crossed the Isthmus of Panamá at Darien, there were wonderful native civilizations in Central America. Ruined cities built by the Mayas are still hidden away in the jungles of Guatemala and Honduras. The Spaniards subjugated more or less thoroughly the various Indian groups, and impressed upon them the Catholic religion and some European civilization. The republics of Guatemala, Salvador, Honduras, Nicaragua, Costa Rica and Panamá—as well as the tiny colony of British Honduras—are all inhabited by Spanish-speaking peoples of mixed Indian, Spanish and Negro origin. This mingling of alien races has been one factor in retarding the development of a tropical region rich in natural products.

CENTRAL AMERICA, that narrow and tortuous stretch of land that forms the connecting link between the continents of North and South America, is one of the world's centres of volcanic activity. No equal space on the earth possesses so many extinct and active volcanoes. Life in a volcanic country means that one can never be quite certain that the house may not collapse suddenly, or a mountain peak burst into flame. Santa María volcano in Guatemala was always looked upon as extinct, but in 1902 it suddenly broke into violent eruption and an area of two thousand square miles was strewn with ashes and pumice stone, ruining houses and plantations and killing hundreds of people. In the same year there was an earth tremor that lasted for nearly a minute, and eight important, flourishing cities were ruined in those seconds of horror.

The volcanic ridges of Central America run from northwest to southeast, keeping close to the Pacific coast. At Panamá the mountains are lower and the narrow peninsula is twisted almost due east and west, so that Balboa was led to call the Pacific the South Sea. The low shores of the Caribbean from British Honduras to Panamá are covered with mangrove swamps and jungle; they are the "hot lands" where mosquitoes swarm and fever threatens. Here are primeval forests rich in cabinet woods and dyewoods of every description. The golden-red mahogany flowers blossom among the scarlet clusters of magnificent big ceiba trees. Down beneath the thick branches lianas and creepers weave a dense impenetrable network of undergrowth, and ferns grow twenty feet high. Brilliant orchids with long jagged waxen petals grow in profusion; one could pick armfuls and not be able to tell where the flowers came from. Red parrots, greenish-blue trogons with tails three feet long, white egrets, toucans with bright bills, varicolored woodpeckers and jewel-like humming-birds add to the luxuriant beauty of the jungle. Alligators swarm in the rivers; there are plenty of snakes, and countless insects. In the rainy season the forest is almost impassable, and this condition prevails for several months in summer. Among the hills, from April to December, the rains take the form of a hard shower every afternoon, with fine clear weather the rest of the day.

The soil is unbelievably fertile. When cleared and properly drained to eliminate the menace of fever and make cultivation possible, it produces good sugar-cane, and bananas by the million. This important fruit is now grown in most districts within quick reach of tidewater and the fast steamers which rush the green bunches to North American markets. In Panamá and Honduras bananas are the chief crop.

As one goes inland from the Caribbean the land rises. River valleys cut through broad uneven wooded highlands three thousand feet and more above sea level. There are fine grazing-grounds for cattle and horses. As in México, patches of

AT COPAN in Honduras there are some remarkable ruins of ancient Maya buildings, elaborately carved with figures, symbols and mythological designs. The figure above represents some god, splendidly isolated among the remnants of that mysterious civilization which dates back to at least 613 B. C., the year the Mayas began to keep their calendar.

ELLIOTT

BEAUTIFUL LAKE ATITLÁN lies in the south of Guatemala, nearly six thousand feet above sea level, with the volcano of Atitlán brooding over it. Like many volcanic lakes, it is very deep, and there are places where one cannot find bottom with a thousand-foot line. The formation of the country makes it liable to earthquakes as well as eruptions, yet such is human persistence and the force of habit that the Indians cultivate their cornfields not only on the border of the lake but almost at the edge of the volcano's crater, high up among the misty white clouds.

ONLY SMALL SHIPS CAN ENTER BELIZE HARBOR

The capital of British Honduras is Belize, famous as the rendezvous of the buccaneers who terrorized the Caribbean Sea during a large part of the seventeenth century. The reef-bound harbor gave them sure shelter from pursuit, for large ships cannot cross the reef at all and even the smallest boat will be wrecked without a skillful pilot.

corn provide the staple food of the people. Cacao plantations flourish, the orange-yellow pods clustering on each tree trunk, and coffee berries show red against the glossy green foliage of the carefully tended trees. Coffee grows high up the mountainsides, thriving on the rich volcanic ash which forms much of the soil. Unless a "fire-mountain" is decidedly active, its slopes are covered with forests and farms to the very edge of the crater.

One volcano after another lifts its beautiful cone in the jagged skyline of the mountain range. When Lindbergh flew from México City to Panamá he found his course sprinkled with volcanic peaks. The country is so rough, mountainous and heavily wooded that railroad construction is very difficult and aeroplanes offer much the easiest means of transportation. Air service is now established throughout Central America, and is constantly being improved. It should have important effects on all the countries, bringing villages, which have been practically isolated in the mountains for centuries, close to civilization. There are towns where the only way to take anything to market is to carry it, and the Indians are trained from childhood until they are able to bear loads of two hundred pounds up and down steep trails.

The Indians are descended from different tribes which inhabited the country in ancient times. The Mayas were the most remarkable, as they had a great empire in Guatemala, Salvador and parts of Honduras and México. The jungle now grows over the massive stone ruins of their cities, and archæologists study the carved inscriptions to discover more of their fascinating history. Other tribes, such as the Mosquito Indians of the Nicaraguan coast and the San Blas Indians of Panamá, were much less civilized.

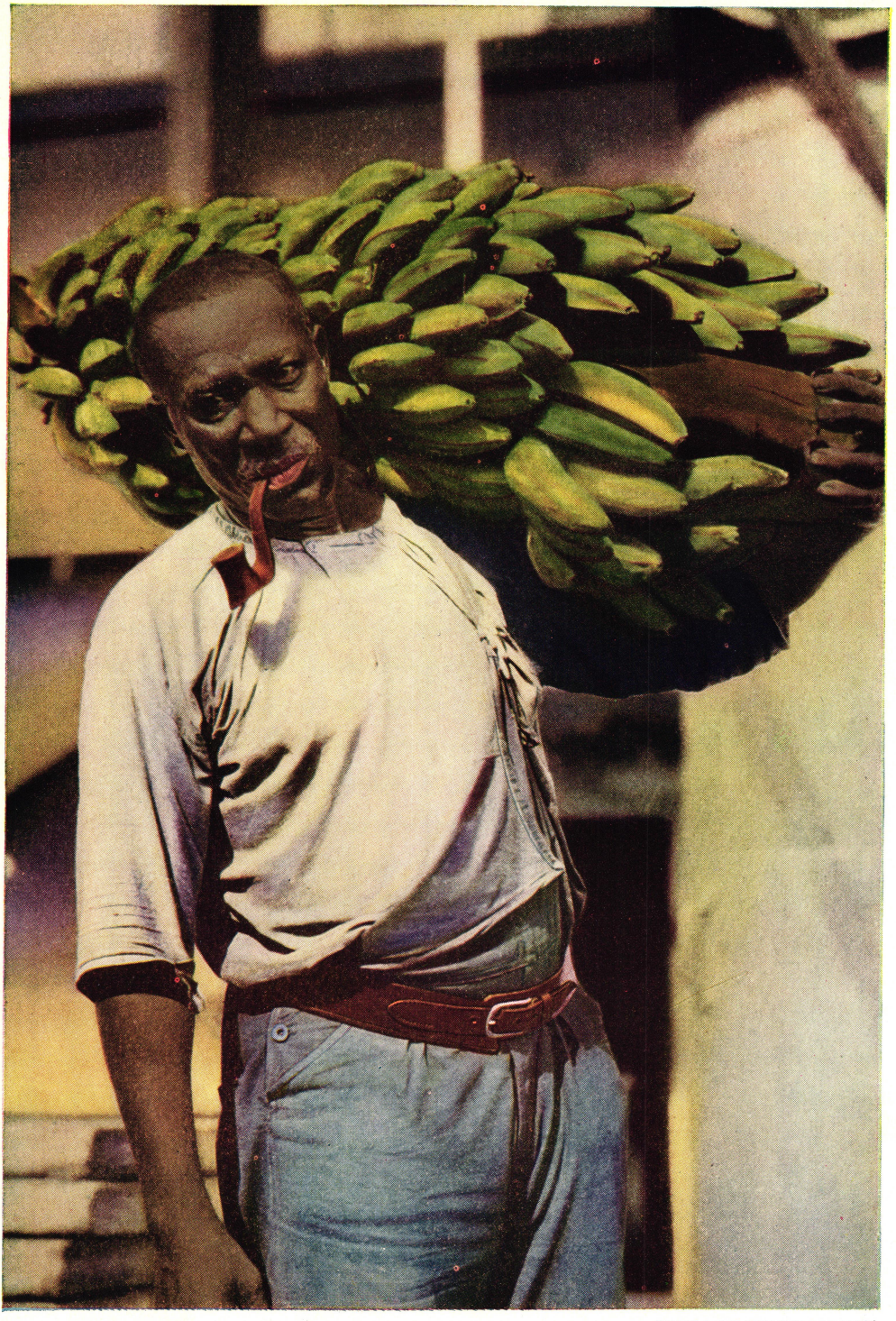
The Spaniards had conquered all these different peoples by 1524. White men came as rulers, the Indians were enslaved, and a mestizo class grew up. (Mestizos, or ladinos, are of mixed Indian and European blood.) The Catholic religion was adopted by the Indians, and the priests built many a beautiful big church. Spanish rule lasted about three hundred years, when Central America revolted along with México. For a time the territory (except for Panamá) was united, but after 1839 the different provinces separated. Panamá was part of the Republic of Colombia until 1903, when the little isthmus state became independent. All of the tiny republics have suffered from civil wars and unwise government. It is very difficult for countries peopled by

such different races as the Indian, the Spanish and the Negro to learn in a short time how to govern themselves, when for centuries they have been used to obeying absolute rulers. The Spaniards have never encouraged popular education, and as a result many of the people are still exceedingly superstitious and ignorant. But there are signs of progress even in the most backward districts, and capital in the form of loans from wealthier nations is helping to develop these lands which are so rich in themselves.

Guatemala is progressive in more than one way. It has better roads and more miles of railway. The old university is the apex of an ambitious educational system which needs better financial support before it can be widely effective. Guatemala is about the size of Portugal, and few portions of the globe can show such extreme variations in altitude or greater climatic contrasts. The hot damp atmosphere of either coast is wholly different from the delightful invigorating air of Guatemala City, the capital, five thousand feet above the sea. The former capital was called Antigua Guatemala and was the greatest, finest city in North America before an earthquake destroyed it in 1773. The shattered walls of churches, convents and palaces still suggest its ancient grandeur, though Indians live in squalor among the ruins. The present city stands some miles to the east, in a valley overshadowed by volcanoes. The beauty of the situation gives no hint of the danger which seems always to menace the capital, yet in 1917 the city was torn to pieces by another earthquake. A hundred thousand people were made homeless and scarcely a wall was left

WHERE WEIGHTS AND MEASURES ARE UNKNOWN

Indian market-women of Guatemala sell everything by the bunch or the handful—two or three eggs and several ears of corn, a few beans, a bundle of sticks for firewood, a couple of papayas, and so on. They always ask more than they expect to receive, but at that the prices are unbelievably low. Their cotton blouses are beautifully embroidered.



THOMAS F. LEE FROM EWING GALLOWAY

BANANAS FOR YOUR BREAKFAST come from several thousand miles away on the eastern coast of Central America—from Costa Rica or perhaps Honduras, or from Guatemala where this stem was grown. The fruit is cut just so many days before it is ripe, and shipped in refrigerated compartments where it ripens by the time it reaches its destination.

GEORGE STONE FROM EWING GALLOWAY

A MARKET WOMAN OF LA UNIÓN in Salvador has set down her basket of fruit in the hope of making a sale, or else just for the sake of a little conversation. She always carries her load upon her head, for that is the Indian woman's way and most Salvadoreans have more Indian than Spanish blood in their veins. The tropical fruits in the basket are luscious past description, and she could sell us not only bananas, oranges and pineapples but less familiar fruits like pomegranates, guavas, star-apples and avocados, which are sometimes called alligator pears.

standing. It has been rebuilt with low stone and stucco houses painted white, or pink or blue or yellow. It is a typical Spanish-American city, where new and old, civilization and barbarism are all to be found. Automobiles fill the streets, and turkey buzzards perch on the housetops when they are not busy cleaning up refuse. If we go to the native market we shall see men and women come trotting down the road in Indian file, the men with huge loads on their backs, the women with tremendous market baskets on their heads. Many of them have been three or four days on the way. Each load they carry is worth perhaps a dollar, which is to them a good week's pay. Of one of these market-women a writer said:

"She had an open-work basket, full of fowls and ducks, on her back, on which was also slung a baby; in her arms she carried a fine young pig and on her head was a tray of tortillas. As she jogged along the baby cried, the porker squealed, and the poultry made noise enough to drown her own groans."

Guatemala is an Indian land, for only about 10 per cent of the inhabitants are white. The Indians live in upland villages of thatched huts and spend their days working as porters, or as cultivators on the big coffee fincas. The women make pottery and weave bright warm blankets of good quality from homespun wool. They embroider their cotton blouses in colorful patterns. Each tribe and village has its own distinctive design, so that an Indian girl's dress always indicates where she was born. The men wear white cotten suits, and in addition an apron of plaid wool. They top their costumes with a bright kerchief and a sugar-loaf straw hat. Altogether, the countryside of Guatemala is as picturesque and beautiful as one could wish.

British Honduras is a slice of land bordering the Caribbean Sea and lying between Guatemala and the Méxican peninsula of Yucatán. It possesses valuable forests of logwood and much mahogany; the first British settlers were buccaneers who came from Jamaica and began to cut

SAN PEDRO SULA HAS NO TRAFFIC PROBLEM

Many a little backwoods town in Honduras is just as quiet and sleepy-looking as this. An automobile would be an event in the main street of San Pedro Sula—provided one could ever get there through the mud. As it is, the photographer seems to furnish welcome diversion, and even the man on the ox-cart has turned to look at the camera.

Publishers Photo Service

THE ONLY KIND OF TEAM FOR HEAVY MUD

When the rains come, most Central American roads are practically impassable, and only oxen like this Costa Rican team have any chance of getting through. Consequently hauling is largely done by ox-cart; in San José, the capital of Costa Rica, one often sees a long train of ox-teams come lumbering down the street laden with coffee or other produce.

timber for a living. There are very few pure-blooded white people in the colony; most of the population have Indian, white and Negro blood in their veins. But the colony has a well-disciplined, British air about it just the same.

The Republic of Honduras lies immediately to the east of Guatemala, and south of British Honduras. Its Caribbean coast has almost been turned into one vast banana plantation. Many millions of bunches are exported annually. Four of the country's five short railway systems have been built by the fruit companies for the use of the plantations. Elsewhere goods are transported by ox-cart or mule-back, though there is a good motor road from the Pacific coast to Tegucigalpa, the capital. Potentially, Honduras is as rich as any land in Central America, but only the banana crop reaches anything like maximum output. Coffee, sugar, coconuts and tobacco are all being produced in increasing quantities. Stock-raising is an industry for which the country is well suited, but there are few head of cattle. Neither is mining at all well developed, although gold and silver, iron, copper and lead exist in worth while quantities. Honduras is an Indian land like Guatemala, but not nearly as enterprising. Its stormy history has left it a burdensome legacy of debt, which handicaps education and economic development.

The situation in Salvador is very different. This, the smallest of the six republics, is the most thickly populated, and has more than twice as many inhabitants as Honduras. Yet it is the only state entirely confined to the Pacific coast, and it is subject, like the others, to violent volcanic disturbances. Volcanic peaks make its skyline jagged, and the highest one, Mount Izalco, is called "the Lighthouse of Salvador" because smoke and flame pour from its cone continuously.

The capital city of San Salvador has been ruined by earthquakes almost a dozen times, but after each disaster the people set to work, clear away the débris and rebuild their homes. Consequently the houses are all low, and built of wood

EXPERIENCE IS THE BEST TEACHER IN GROWING GOOD TOBACCO

The tobacco plant is native to America, and has for ages been cultivated in the warm regions of both continents, North and South. In quality Central American tobacco does not equal the Cuban product, and so is grown only for home consumption. With scientific cultivation, however, the quality of the leaf can be improved, and at this Nicaraguan farm school the best methods are taught. Tobacco plants require unusually careful treatment. The soil must be just right and must be kept loose around the roots by skillful cultivation as the students are learning here.

HOME FROM THE SLOW TRIP TO TOWN

In Salvador the inevitable Central American ox-cart looks a little like a small, crude Conestoga wagon. The sides are built up with poles and a cowhide is spread over the top, as we see in the cart at the left. These villagers are mestizos of the cattle district, which daily sends plenty of meat to the capital, San Salvador.

or adobe brightly painted. They have red tiled roofs and patios full of beautiful flowering shrubs. The city is not only attractive, but has a cultured, cosmopolitan up-to-date life. It is situated on the lower slopes of the mountain range, with volcanoes all about.

The whole mountainous little country reflects the energetic spirit of the capital. Salvador has had its revolutions, and its finances are none too stable, but now almost every square inch of good ground is cultivated. The peasants bring produce to town in ox-carts covered with hides. Coffee is the great crop, constituting over nine-tenths of the exports. Other products are sugar, cacao and cotton. The government experiments with crops and cattle-breeding, builds roads, encourages the development of mining, and looks carefully after public health.

Nicaragua is less fortunate. It has been incessantly troubled by revolutions ever since becoming independent of Spain. The government finally grew so chaotic that foreign intervention was provoked; Great Britian twice intervened, and since 1912, a force of United States marines has usually been present. Once Nicaragua succeeds in establishing a strong government, it will be able to develop its resources. At present, half the country is jungle land, especially along the Caribbean shore and the Honduran bor-

Ewing Galloway

MOMOTOMBO'S GRIM CRATER CONSTANTLY SENDS FORTH CLOUDS OF SCORCHING STEAM

From the shores of Lake Managua rises the smoking cone of the largest volcano in Nicaragua. At night Momotombo's red glow is visible in Managua, the capital, at the other end of the lake. This close-up of the crater was taken from one aeroplane while another, seen through the steam, circled near by. Aeroplanes have already proved their usefulness in exploring and mapping the wilder parts of Nicaragua, and air service for mail and passengers is increasingly important throughout mountainous Central America, where road and railway building are so difficult.

Ewing Galloway

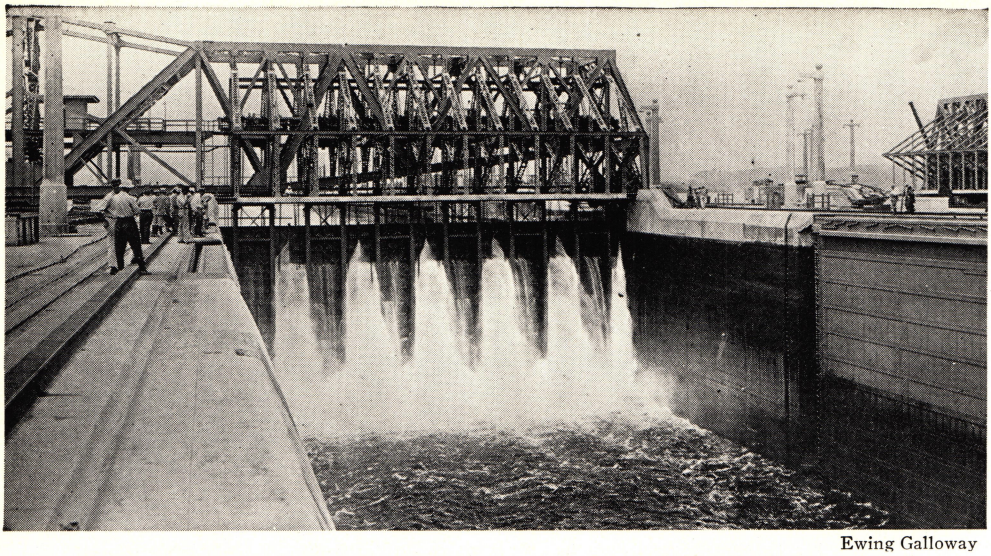
OIL FROM CALIFORNIA BOUND EAST THROUGH THE GAILLARD CUT

At Culebra the Panama Canal pierces the Continental Divide by means of the great Gaillard Cut, which is over eight miles long. The excavation of this part of the canal was very difficult, for landslides undid much of the work as fast as it was done. Beyond the tanker we can see a big dredge at work keeping the channel open.

der. When the valuable timber has been cleared, the soil is ideal for banana trees, and many thousands of acres have already been planted. But most of Nicaragua's Spanish and Indian population live in the mountainous western half of the country, around beautiful Lake Nicaragua and Lake Managua. Here are the old Spanish cities, Granada and León. León used to be the capital, but Granada claimed the honor, and finally Managua was selected in order to discriminate against neither. The principal port is little Corinto on the Pacific, where palms shade the hot streets and the chief excitement is the arrival of a steamer to take on bags of coffee. Peons loll about, smoking black cigars and trying to look dignified. They are somewhat lazy and ragged, wearing dirty shirts, trousers wide at the bottom and tight at the knee, and high-crowned, broad-brimmed hats of palmetto straw. On Sunday afternoons they watch cock fights and are willing at any time to play billiards or gamble; while whenever there is a bull fight in the neighborhood they will be there. Bull fights modeled on Spanish lines are held all over Central America.

Costa Rica, the second smallest of the Central American states, is a narrow piece of land southeast of Nicaragua. The little country is famous for coffee and bananas; it also possesses an extraordinarily rich variety of birds and reptiles, and wild hogs roam the tropical lowland forests where ferns grow twenty feet high and orchids hang from the great trees. At a greater altitude the grassy highlands called savannahs make ideal pastures and the stock farms raise hardy little horses and some fine cattle.

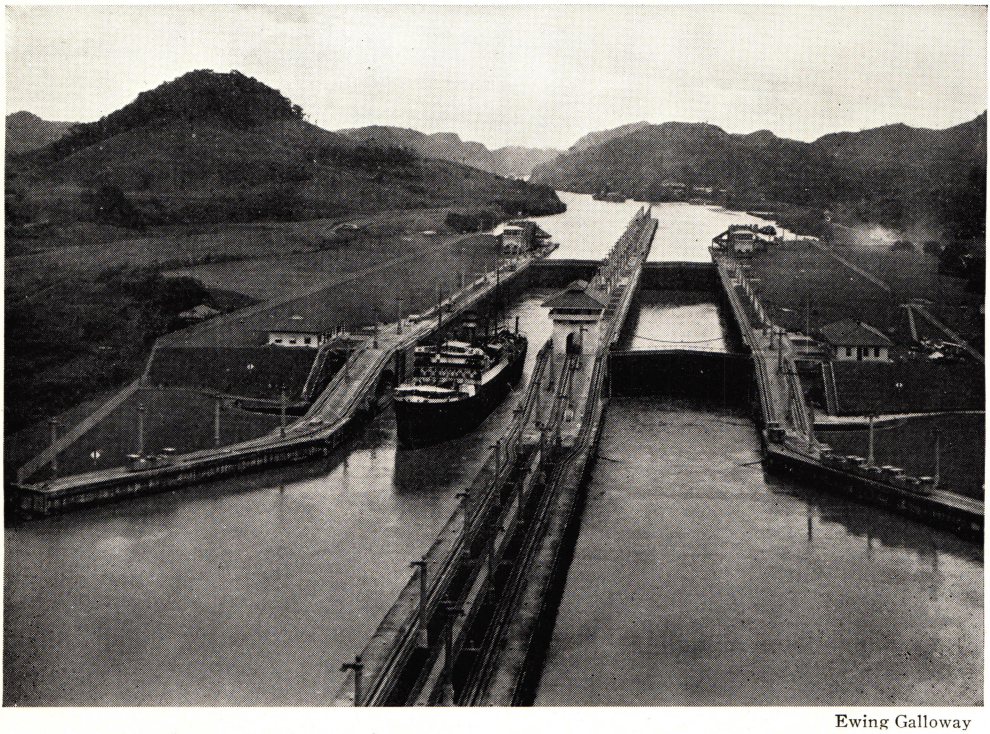
The land has suffered from eruptions and earthquakes. Irazú volcano is over eleven hundred feet high. Mount Poas has two craters—one hot and sulphurous, one full of cold green water. An earth-



Ewing Galloway

CLOSING THE EAST EMERGENCY DAM OF THE GATUN LOCKS

Each flight of locks on the Canal is protected at the upper end by a movable emergency dam, like this one at Gatun, which checks the flow of water from the great Gatun Lake beyond. The steel bridge is swung across into position, then the vertical girders and the gate sections between are lowered in turn until the water is cut off.



Ewing Galloway

TOWING A BIG SHIP OUT OF THE LOCK AT PEDRO MIGUEL

Large vessels are handled very carefully in the locks of the Panamá Canal. The fender chains stretched across the water prevent a ship from ramming the gates, and four big electric locomotives tow each vessel in and out of the lock. This ship has just been lowered thirty feet from the level of the water in the Gaillard Cut behind.

George Stone from Ewing Galloway

THE OLD AND THE NEW IN PANAMÁ CITY

When the Cathedral was built in 1760, smoothly-paved streets and automobiles were undreamt of anywhere. Panamá City is enclosed by the Canal Zone and has consequently become much Americanized, but the ironwork of windows and balconies and the mellow beauty of the Cathedral preserve the atmosphere of former days.

COFFEE TREES SPREAD UP THE SIDES OF THIS GREEN VALLEY

The soil here is fertile volcanic ash, sometimes reddish, sometimes gray, and where the bare earth shows between the trees it contrasts pleasingly with the green foliage. Coffee trees are quite beautiful, with their dark glossy leaves. On the day they flower—the blossoms last only twenty-four hours—the plantation is indeed a wonderful sight, well worth a long journey.

quake following one of its eruptions ruined the beautiful old capital, Cartago, so San José is now the capital. One sees more white people on its streets than in the other Central American capitals, for Costa Rica has fewer Indians and half-breeds. The Negroes are concentrated on the banana plantations of the Atlantic coast, where other races seem unable to endure the heat. The Costa Ricans are mainly a peaceable, steady-going people, the quietest of all the Central Americans. Many of the coffee plantations are small, but the quality of the berries has a reputation. Americans own the banana plantations. Costa Rica also possesses valuable pearl fisheries, and gold and silver mines which provide an important industry. Altogether, it is a prosperous little country, and one which exemplifies the value of education. School attendance has long been compulsory. When Mr. Hoover visited San José on his tour of Latin-America, he was greeted not by soldiers but by school children, and this incident well expressed the temper of the republic.

Next to Costa Rica on the east is long, narrow Panamá, the isthmus country. At the Canal Zone, where the Rocky Mountains seem to greet the Andes, the hills are but three hundred feet high, and the distance from coast to coast is only thirty-five miles as the crow flies. The Spaniards long ago conceived the idea of a canal here, but the dream was not fulfilled until four hundred years after Balboa sighted the Pacific. To-day most people think first of the Canal when they think of Panamá, not realizing that the isthmus has been one of the world's great trade routes since even before the days when trains of pack mules carried Peruvian silver from Panamá City to Porto Bello. After the discovery of gold in California many adventurers sailed from New York to Panamá and made their way west across the isthmus, instead of going by the overland route in the United States, or sailing all the way around Cape Horn. The Panamá Railroad, first coast-to-coast line in America, was built soon after 1850 to carry these travelers quickly through the difficult jungle to Panamá City, where they took ship up the west coast.

Panamá was discovered early in the history of the New World; Columbus reached it on his fourth voyage, and a settlement soon sprang up. Then Balboa, the governor of the new colony, discov-

AT THE HEADWATERS OF THE REVENTAZON RIVER IN COSTA RICA

The ripe berries are a rich red in color. Many of the "fincas," as the coffee estates are called, are small, but this one in the Reventazon Valley is very extensive. Coffee is Costa Rica's great crop. The quality of the berries is especially fine, and Costa Rican coffee consequently commands top prices in foreign markets. Most of it goes to England and the Continent.

ered the Pacific in 1513 and Panamá City became the base from which Spain explored, conquered, colonized and exploited the west coast of South America. The enormous treasure of gold, silver and jewels from the Inca lands was sent up the coast to Panamá City. There it was loaded onto mules, transported over the famous jungle trail to Porto Bello on the Caribbean, and stowed away in the holds of galleons which sailed for Spain.

The fame of the treasure ships spread far and wide, attracting swarms of pirates to the Caribbean. Sir Henry Morgan was one of the most notorious, and he organized a great expedition against Panamá in 1671. After struggling across the isthmus Morgan and his buccaneers captured, looted and burned the wealthy capital. Its ruins may be seen to-day, not far from Panamá City.

Without the Canal, modern Panamá would be very different. The exciting story of the great Canal has been told many times. We remember how the French began the job under the direction of the famous engineer De Lesseps, and how the Americans took it up where the French left off. General Goethals was the man who completed the engineering work, and it was General Gorgas who paved the way for the actual construction by stamping out yellow fever. To-day the Canal is a vital factor in world commerce, as well as in the life of Panamá. The water and sewage systems of the cities are run by the government of the Canal Zone, and strict sanitary regulations are enforced, to lessen the danger of disease in this hot damp climate.

The Canal has given Panamá a population as mixed as that of any place on earth. There are North Americans, both tourists and Canal employees; there are Spaniards, Germans and Englishmen, Italians, Chinese, Frenchmen, Negroes from Jamaica, Indians of various kinds, and, of course, Panamanians by birth, but even they conform to no one type.

Outside the cities Panamá is not completely explored and developed. Jungle covers many of the low mountains and the swampy valleys. So difficult is it to penetrate the heavy growth that the San Blas Indians of Darien have successfully fought off civilization to this very day. Like all of Central America, it is a tropical wonderland, though not so strikingly beautiful as volcanic Guatemala, and Nicaragua with its lakes.

CENTRAL AMERICA: FACTS AND FIGURES

GUATEMALA (República de Guatemala)

Bounded north and west by México, west and south by the Pacific, south and east by Salvador, east by Honduras, the Caribbean and British Honduras. Estimated area, 42,353 square miles. Population (estimated 1927), 2,454,000, 60% Indians. Government by a National Assembly, a Council of State and a President; universal suffrage. Catholicism predominant; other denominations tolerated; 3,297 primary schools, besides the University and secondary and special schools. Agriculture the chief industry, with emphasis on coffee and bananas; 1929-30 coffee crop, 99,912,000 pounds; bananas exported, 6,424,633 bunches. Mahogany, dyewoods, chicle, gold and mica also exported. Ports: Puerto Barrios on Caribbean and San José on Pacific. Railway mileage, over 700 miles. Capital, Guatemala, 120,707.

BRITISH HONDURAS (Crown Colony of Great Britain)

Bounded north by México, west and south by Guatemala, east by the Caribbean. Area, 8,598. Population (estimated 1929), 51,228. Total school attendance, 7,564. Governed as a Crown Colony, with a Governor, an Executive Council and a Legislative Council. Chief products: mahogany, logwood, bananas, citrus fruits, cacao, plantains, chicle. Capital and chief port, Belize, 12,661.

HONDURAS (República de Honduras)

Bounded north and east by the Caribbean Sea, west by Guatemala, south by Salvador and the Pacific Ocean (Gulf of Fonseca), south and east by Nicaragua. Area, about 44,275 square miles. Population (1929), 859,761. Government includes a Congress and a President elected directly for 4 years, and when Congress is not in session, a Permanent Commission of 5 members. Agriculture the chief industry: bananas, sugar, coconuts, coffee; 29,083,665 bunches of bananas exported in 1929-30. Silver mined in small quantities. Highways being extended; railways confined to north coast. Capital, Tegucigalpa, 40,049. Chief ports: Amapala on the Pacific, Puerto Cortés, Tela on the Caribbean.

SALVADOR (República de El Salvador)

Bounded northeast by Honduras, northwest by Guatemala, south by the Pacific, east by the Gulf of Fonseca and Honduras. Area, 13,176. Population (census of 1929), 1,437,611. Government by a Congress, a President and 4 Ministers; universal suffrage. Catholicism dominant. Education free and compulsory; 938 primary schools, also secondary and special schools and a National University. Of total area 80% is cultivated. Coffee the creat crop; 103,137,000 pounds exported in 1929. Other products: sugar, balsam, henequén, indigo, gold. Capital, San Salvador, 85,300; chief ports: Acajutla, La Unión. Railway mileage, 349; highway mileage, 1,476.

NICARAGUA (República de Nicaragua)

Bounded north by Honduras, west by Pacific Ocean, south by Costa Rica, east by the Caribbean. Area about 49,500. Population (estimated 1930), 750,000. Governed by Congress of 2 houses, President and Cabinet. Catholicism dominant. Primary education free and compulsory; 489 schools of all kinds and 3 universities. Chief agricultural products: bananas, coconuts, coffee, sugar, tobacco; 4,092,388 bunches of bananas and 63,475,640 pounds of coffee exported in 1929. Other products: mahogany, cedar, dyewoods, gold, hides and skins. Railway mileage, 214; highways being extended. Capital, Managua, 32,536. Ports: Corinto and San Juan del Sur on Pacific, Bluefields and San Juan del Norte (Greytown) on the Caribbean.

COSTA RICA (República de Costa Rica)

Bounded north by Nicaragua, west by the Pacific, southeast by Panamá, east by the Caribbean. Estimated area, 23,000. Population (1927), 471,525. Government by a Congress and a President; universal male suffrage for all in full enjoyment of civil rights. Catholicism the state religion but other denominations tolerated. Elementary education free and compulsory; attendance (1930), 46,675. Several higher schools and a new university. Only 4% of area cultivated, but agriculture most important. Chief crops: coffee (43,000,000 pounds in 1928-29), bananas (5,418,416 bunches in 1930), cacao. Other products: timber and gold. Railway mileage, 412. Chief ports: Puntarenas on the Pacific and Puerto Limón on the Caribbean. Capital, San José, 51,459.

PANAMA (República de Panamá)

Bounded north by the Caribbean, north and west by Costa Rica, south by the Pacific and Gulf of Panamá, east by Columbia. Cut in two by Panamá Canal. Area, 32,380 square miles; population (1930), 467,459. Government by Chamber of Deputies, President and Cabinet. Catholicism dominant, but other denominations represented, especially in Canal Zone. Elementary education free and compulsory; 1930 enrollment, 57,592. In addition to private and special schools there are a national University and the Bolivarian University, a Pan-American institution. Agriculture predominant; bananas (4,678,000 bunches, 1929), cacao, coffee, coconuts. Forest products: mahogany, sarsaparilla, rubber. Cattle-raising important, also pearl-fishing. Capital, Panamá, 60,000.

THE CANAL ZONE

Strip of land extending on each side of the Panama Canal (not including the cities of Colon and Panamá) was granted by treaty to the United States in 1904. Administered by the War Department. Area, 549 square miles; population (1930), 39,426. Chief ports: Cristóbal, at Caribbean entrance; Balboa at Pacific entrance.

THE PEARL OF THE ANTILLES

Rich Tropical Beauty of Romantic Cuba

Cuba has been called "The Pearl of the Antilles," and certainly the Spaniards must have been pleased with the land Columbus discovered for them. Increasing numbers of colonists crossed the sea until Cuba was a centre of Spanish civilization. From Havana every year great galleons sailed home to Spain deep laden with the treasure obtained by the slaves. The fame of this rich island spread far and wide, bringing down swarms of pirates of every nationality. Cuba is now independent of Spain, and derives most of its wealth from the vast fields of sugar-cane and the tobacco plantations which cover so much of its territory.

WHEN Christopher Columbus discovered Cuba in 1492, he described it as "the most beautiful land that eyes had ever beheld." The long low coastline is bordered north and south by chains of coral islets, and indented with many superb bays and harbors. On one of these stands Havana, for centuries the foremost city of the West Indies. Inland, hills and plains are planted with acres of rustling sugar-cane and green tobacco, the rolling panorama broken by clumps or avenues of royal palms. The island has a backbone of low irregular mountains. Those in the west are of hard blue limestone and contain many beautiful caverns where in the early days the Indians took refuge from their Spanish conquerors. In some places rivers disappear into the ground and flow through hidden channels, to reappear at distant spots. To the east, where the narrow island widens out, primeval jungle growth covers the slopes and ravines of higher mountain ranges. Here orchids and lianas hang from mahogany, rosewood and cedar trees. The fertility of the soil is amazing; pineapples produce three and four crops a year, and a planting of sugar-cane can be cut for five years. In all the world there is, perhaps, no other country more favorably endowed by nature. Copper and iron are plentiful, there are asphalt and manganese deposits, and every tropical and semi-tropical plant known to man will grow.

Cuba was first settled by the Spaniards in 1511, and soon became a centre of colonial authority, a base for exploring expeditions to México, Yucatán and Florida. Copper mines, fertile soil, and slave labor imported from Africa made it one of the richest Spanish colonies. Its position on the edge of the Caribbean was commercially advantageous, though exposing it to constant danger from pirates —French, English and Dutch. It prospered in spite of colonial restrictions on commerce, until eventually foreign trade was legalized. During the nineteenth century, when all the other Latin American countries had won independence, Cuba became increasingly discontented. Heavy taxes and oppressive government finally led to serious trouble, and one bloody and destructive war lasted ten years (1868-78). Slavery was abolished after that, but the government of the island continued to be unsatisfactory, and revolt broke out again in 1895.

In the United States people were sympathetic with the Cuban cause, and when the American battleship Maine was blown up in Havana harbor—supposedly by the Spaniards—the result was war between the United States and Spain. In this war Cuba was finally lost to Spain, but did not immediately receive independence. From 1899 to 1902 the United States conducted the administration, which supervised the building of roads, schools and drainage systems. Sanitation was introduced into the cities and the island was completely cleared of its ancient scourge of yellow fever. Then the American flag was lowered from Morro Castle, which commands Havana harbor, and the single-starred banner of the

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ONE OF CUBA'S BEAUTY SPOTS: THE SUNNY GREEN VALLEY OF THE LITTLE RIVER YUMURÍ

The rivers of Cuba are very small and of no use for navigation, and the Yumurí, in Matanzas province, is no exception to this rule. Nevertheless it is a much visited river, because its little circular valley is so beautifully peaceful and fertile. Some parts of the island are mountainous, others are covered by dense forests, but here the gently rolling hills are grass-covered, and the graceful royal palm is the chief tree. This palm is generally between 50 and 75 feet high. Every part, from roots to feathery fronds, is used by the Cubans.

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CHIMNEYLESS AND WINDOWLESS, A PALM-THATCHED CUBAN HOMESTEAD SHELTERED BY A HUGE CEIBA TREE

The ceiba tree, or bombax, the giant of the Cuban countryside, is generally 100 and sometimes even 150 feet in height. It is a very beautiful tree, though quite different from the stately royal palm. It has wide-spreading branches, leaves something like those of the horse-chestnut, and great bell-shaped flowers. The ceiba is also called the silk-cotton tree, because its seeds are covered with a mass of fibre rather like cotton, which is used for stuffing mattresses. The bark of some species has strong fibres, from which ropes are made.

Clay & Bocke Co.

HOW THE HAVANA FACTORY HAND IS AMUSED WHILE HE WORKS

Rolling cigars and cigarettes all day is rather monotonous. So the Cuban factory hands arrange for a man to read to them, each contributing toward his pay. This man is reading from a newspaper, but often he reads one of the national classics, poetry as well as prose. A favorite book is Don Quixote. Sometimes music is played to entertain the men.

Cuban Republic rose in its stead. Unhappily the Cubans had never had any training in self-government, and the result of their first attempt was not successful. The United States again took charge temporarily, but in 1909 the republic was re-established, though the United States still retains the power to intervene in Cuban affairs if financial or political disorder threatens. It did so unofficially during the financial crisis of 1920, when many banks failed because of sugar speculation.

When the Spaniards came to Cuba they found it populated by a race of tall, copper-colored folk who fled at the sight of white men. These people lived in caves or villages and grew cassava and maize. They used tools of stone and dishes of earthenware, while their ornaments were made of shell and polished stone. Although they were gentle and harmless, not in the least like the savage Caribs who inhabited some of the other West Indian islands, the Spaniards enslaved and destroyed them so that few traces of them remain. In eastern Cuba are families with Indian features, but the ordinary islanders of to-day show small sign of Indian blood. They are a result of the intermingling of the Spanish and Negro races. In a street of a Cuban city, one sees faces of every color from white through tan and brown to chocolate and black. French settlers began coming from Santo Domingo when the Negroes of that island revolted in 1791, and this immigration added still another element to the racial mixture. The white population outnumbers the colored in most sections, which is not usually the case in the West Indies. The average Cuban is intelligent, good-tempered and pleasant, and always able to enjoy life. Severe poverty is rare, although many of the less ambitious are content to live in poor conditions. The great planters maintain homes of luxury, both in the country and in Havana's fine residential districts. Most of the sugar-cane and tobacco prop-

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NO DOUBT ABOUT THE POULTRY BEING FRESH

In Cuba we can be quite sure that we get a fresh turkey or chicken for our dinner, because the live birds are carried about the streets hung by their legs from a mule's pack saddle. The poulterer goes from house to house and kills a bird only when it is sold. This is because food does not long keep good in such hot weather.

erties are in the hands of foreigners, who own two-thirds of the gigantic sugar business.

The sugar crop is Cuba's great source of wealth. It exceeds four million tons yearly, and is capable of still greater expansion. Various as are the island's resources, its welfare is inseparable from this one industry. Sugar-cane is grown from one end of the island to the other. Only in the choice tobacco district is one long out of sight of the interminable fields of pale green stocks. During and after the World War, when Cuba was the all-important source of sugar, speculation almost ruined the industry. It was rehabilitated by American finance, and now once more the natural advantages of soil, climate and cheap labor are giving Cuban sugar its prominent place in world markets. But it must meet increasing competition from sugar-beet growers in Europe and the United States.

Cuban tobacco is the best in the world. The finest comes from Pinar del Río, in western Cuba. Here the soil and climate are unusually good for tobacco-raising, and the land is worth a thousand dollars an acre. A vega, or farm, of twenty acres thus represents a valuable investment, and often planters are unwilling to give up any of their choice land for

TOBACCO IS TENDED LIKE A HOTHOUSE PLANT

Tobacco plants need careful treatment, and here we see workers examining the leaves for insect pests. Great skill is needed to grow really fine cigar tobacco. It is necessary to know exactly where to make the seed bed, how to protect and cultivate the plants, and when to cut the crop. In the cutting, one day too soon or too late will make a difference in quality.

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HOW THE BURNING SUN IS KEPT FROM THE TOBACCO PLANTS

Tobacco growers have found that the plants produce finer leaves if they are grown in the shade, so they spread great lengths of cheesecloth over the fields. Not only does this shelter the delicate plants from the sun, but it helps to keep them at much the same temperature day and night, and also protects them from damage by heavy rains or winds.

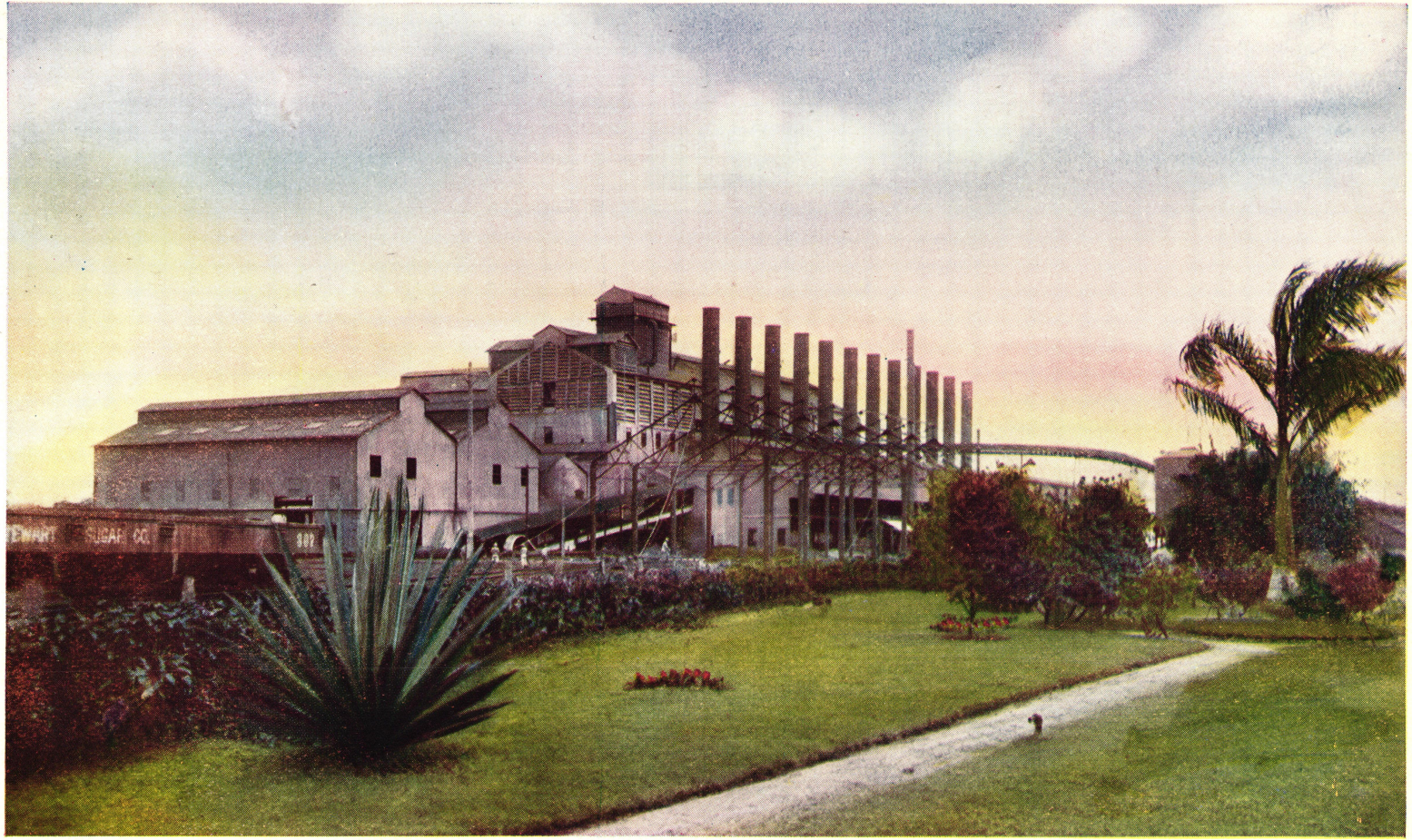
SUGAR-CANE IS GROWN AS FAR AS EYE CAN SEE

Sugar-cane grows throughout Cuba, covering over one and a half million acres. In cutting season, thousands of workers come from Jamaica and elsewhere in the West Indies, and from December to June their sharp knives are busy cutting and trimming cane. The juicy stalks are packed into ox-carts with high sides like a hayrick, and drawn to the railroad.

railroads or similar public works. The Cuban planters still use the old-fashioned wooden plows, and it is certain that some foreign growers have spoiled their crops by plowing too deeply with steel plows, and so mixing the lower layer of clay with the surface soil. The foreigners, however, are credited with devising the method of growing tobacco under a roof of cheesecloth. The leaf so grown has better texture and color than the best produced under ordinary exposed conditions.

Cuba's agricultural possibilities are far from being fully developed. Climate and fertile soil give the island that luxuriance of growth so typical of the tropics. A little care and work are quickly and abundantly repaid. Then too it occupies a fortunate position in relation to North American markets, an advantage greatly increased by the presence of many excellent harbors. Of these, Havana is the best known and the most important, but Santiago on the southern coast has an equally good port. Guantánamo, to the east of Santiago, is leased to the United States as a naval station. Across from Santiago and Guantánamo, on the northeastern shore of the island, lies Nipe Bay, as interesting in the light of its future as of its past. This magnificent harbor was of old a pirates' rendezvous, then a smugglers' base and a fishermen's haven; now it is a growing port, the focus of eastern Cuba's agricultural development. Throughout the surrounding country truck farms and fruit plantations flourish, sending produce to New York as early as November. Coffee and cacao plantations centre here and one of the most important sugar mills in Cuba is situated near Antilla, on Nipe Bay. The hills of this eastern province of Oriente used to yield copper in large quantities, and one range is consequently named Sierra de Cobre. Nowadays these mines are no longer worked, but iron ore is dug from open-pit mines easily and cheaply, and many thousand tons are annually exported to the United States.

Oriente province, with its capital, Santiago, has played its full part in Cuban history. Diego Velásquez, the conqueror of Cuba, built Santiago in 1514 and it was for years the capital of the whole island. Situated on the hills above its beautiful harbor, it appears impregnable, for the entrance to the bay is through a narrow channel guarded by fortified cliffs. But in colonial days it was twice plundered by French and by British pirates, while the combined land and sea attack of Americans and Cubans in the



AMERICAN PHOTO STUDIOS, HAVANA

A BIG SUGAR MILL is fed by cane from many broad acres. Private railways criss-cross the large sugar plantations in all directions, converging at the central, or mill, where the cane is ground. The product of Cuban mills is raw sugar—coarse brown crystals which refineries transform into the familiar fine white sugar we use daily. Cuba is easily the largest producer of sugar in the world. The ordinary output of cane and beet sugar in the United States is about one-fourth the Cuban crop, most of which goes to the United States.

AMERICAN PHOTO STUDIOS, HAVANA

SOIL BRINGS a very high price per acre in the Vuelte Abajo region of western Cuba, for there are the best tobacco lands on the island. It is the top soil which is so valuable, and growers have been known to sell right-of-way to a new railroad only on condition that they first be allowed to remove the top layer of earth. Perfect climate and perfect soil combined make it possible to grow the finest Cuban cigar tobacco. The green leaves are picked at just the right stage of development and taken to the drying house, where they are kept until rich brown in color.

© Cutler

HORSES WAIT FOR THEIR MASTERS OUTSIDE A VILLAGE SHOP

A Cuban plantation store sells everything from cosmetics to the great knives known as machetes. This one seems to be doing a good business while the horses wait. The usual Cuban horse, descended from those brought over by the Spaniards long ago, is small and strong; it makes a very good pack animal and has an easy riding gait.

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AMONG THE HEAVILY WOODED MOUNTAINS OF EASTERN CUBA

In the province of Oriente coffee-growing is still important, although it has declined somewhat since the middle of the nineteenth century, when it was the most flourishing industry in the island. The square enclosure in this photograph is the drying ground, where the berries from the finca, or coffee farm, are spread out in the sun.

Spanish-American War overcame the city a third time. To-day the old forts and batteries are crumbling, and merely render the spot more picturesque.

Leaving the cities, mines, plantations and forests of Oriente, one comes to a very different section. Camagüey, the next province to the west, is cattle country, affording pasture for the greater part of the four million head of cattle on the island. The fascinating old city of Camagüey is the one large inland city in Cuba. Its first settlers left the northern coast in an attempt to escape from pirate raids. Pirates were the bane of Cuba's colonial existence; they used its well-protected harbors and took refuge on its tiny islands. Of all the Caribbean buccaneers, Sir Henry Morgan was the one most feared in Spanish colonies of the seventeenth century. Secretly countenanced by the British government, he terrorized and sacked Porto Bello, Panama and Maracaibo, besides descending periodically upon the coast of Cuba. In 1668 Morgan raided Camagüey, killed some of its people and shut the rest up to starve in churches, while his men feasted on the town's provisions and collected everything of value.

Colorful Cities of Old Cuba

It is said that the crooked streets of Camagüey were purposely built with many twists and puzzling turns in order to baffle pirates. Be that as it may, the town is a maze of irregular cobbled thoroughfares, with narrow uneven sidewalks under jutting windows, through which we may see a patio, or courtyard, with fountain, luxuriant shrubs and huge water jar. There is plenty of life and bustle indoors and out. Cattle-men and cow-ponies are a common sight in the streets, making their way past slow-moving ox-carts with huge high wheels. Peddlers in carts compete with peddlers on donkeys; one may buy milk from a wagon or from cans slung in panniers. House-to-house selling is the universal Cuban method of marketing foodstuffs. Here and there the little street opens out into a plaza, and church towers rise above the flat bright roofs. The Church of La Merced is three hundred years old, and served as one of Henry Morgan's temporary prisons in 1668. The old-world atmosphere of the whole place is pronounced, more so than in any other large Cuban city.

The Key City of the West Indies

Havana, on the other hand, is a striking combination of the old world and the new. "Key of the New World and Bulwark of the West Indies" was the title granted it by the kings of Spain. Four strong forts were built to defend it, among them Morro Castle, at the harbor mouth. Now tourists flock here every winter and as a gay resort it is unrivaled on this side of the Atlantic. Yet as a background for all the gaiety there remain old houses and fortresses which have seen troubled days, and which serve as reminders of the city's long history.

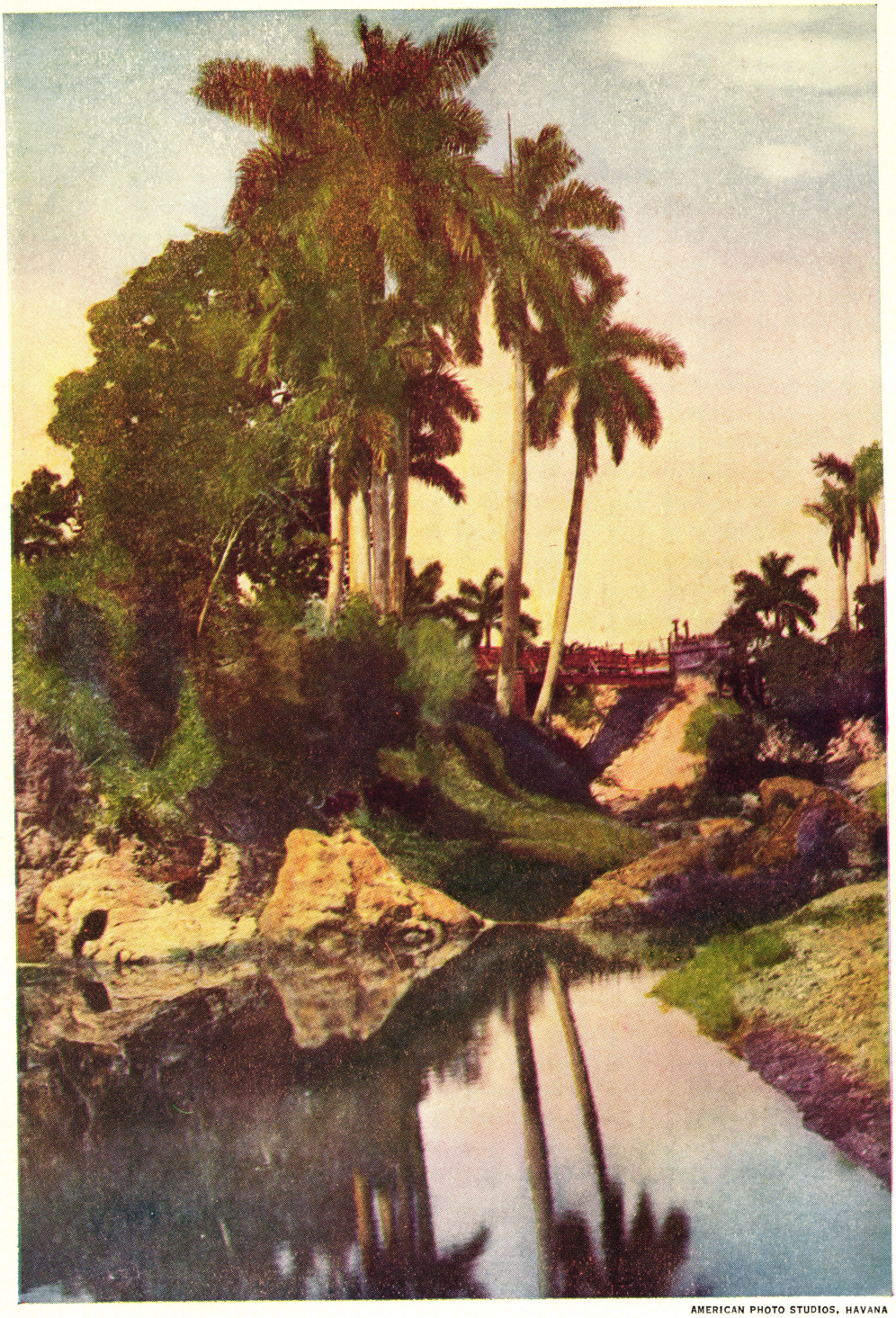
The capital of Cuba is cosmopolitan, but gains additional charm from the Spanish atmosphere yet lingering in its streets. Life here seems full of grace and pleasure; it is not necessary to be strenuous. The opera, the theatre, motion pictures, rich clubs, great hotels, the Casino and the ever-available lotteries furnish amusement for all kinds of people. And there are many different types in Havana: Cubans of all shades, Spaniards and other Europeans, Chinese, Central American mestizos, West Indian mulattoes, Haitian Negroes, North Americans.

A Gay and Charming Capital

The streets are very narrow. An old law required that they should be so, with the idea that they would be less sunny and hot. Originally they had no pavements, for all people of any importance rode, and the rest had to take the risk of being run down. But in the newer western suburbs there are broad avenues, great houses and beautiful gardens, while atop the sea wall runs the magnificent Malecón drive. The houses, some built of brick, some of white limestone, are often plastered outside, and the plaster is of all colors, from white or cream to pink,

AMERICAN PHOTO STUDIOS, HAVANA

THE COBBLED STREETS OF OLD SANTIAGO are narrow and climb steeply up hill and down, for the city is built on ground that rises sharply from the edge of a fine big harbor. Seen from aboard ship at the narrow harbor entrance, the red tiled roofs show up brightly against a background of green mountains, with the blue bay shining below. The houses are low and their thick walls are solidly built; as we can see here, some are painted white and others are of any color that strikes the owner's fancy—pink, blue or yellow. Many are old, like the one which belonged to Cortés before he set out to conquer México in 1519. There are no chimneys, for since Santiago is the hottest city in Cuba, heating systems are superfluous and cooking is done with charcoal, which does not make much smoke. In Santiago it is not necessary to go to market to buy food, because there are so many peddlers that almost everything is brought right to the door. This man's donkeys carry panniers full of fresh fruits and vegetables from the country roundabout.



AMERICAN PHOTO STUDIOS, HAVANA

GRACEFUL PALM TREES are the most striking feature of the landscape in almost every part of Cuba, and they are useful as well as artistic. The royal palm, especially, is always a thing of stately beauty, whether growing in long straight avenues on some plantation or by the banks of a stream which reflects the slender trunk and delicate leaves.

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CUBA'S BEAUTIFUL CAPITAL RISES FROM THE LOW SHORES OF THE SPACIOUS BAY OF HAVANA

The present city of Havana was founded by the Spaniards in 1519 and was sacked by pirates twice before it was fifty years old. Here gathered the annual treasure fleet carrying tribute to Spain, and all Spanish ships bound for the mother country put in at Havana to provision. Cortés stopped here on his way to México; Hernando de Soto assembled his fleet in the harbor before sailing for Florida and the discovery of the Mississippi. To-day the harbor is filled with shipping from all the corners of the earth, and seaplanes carrying mail and passengers.

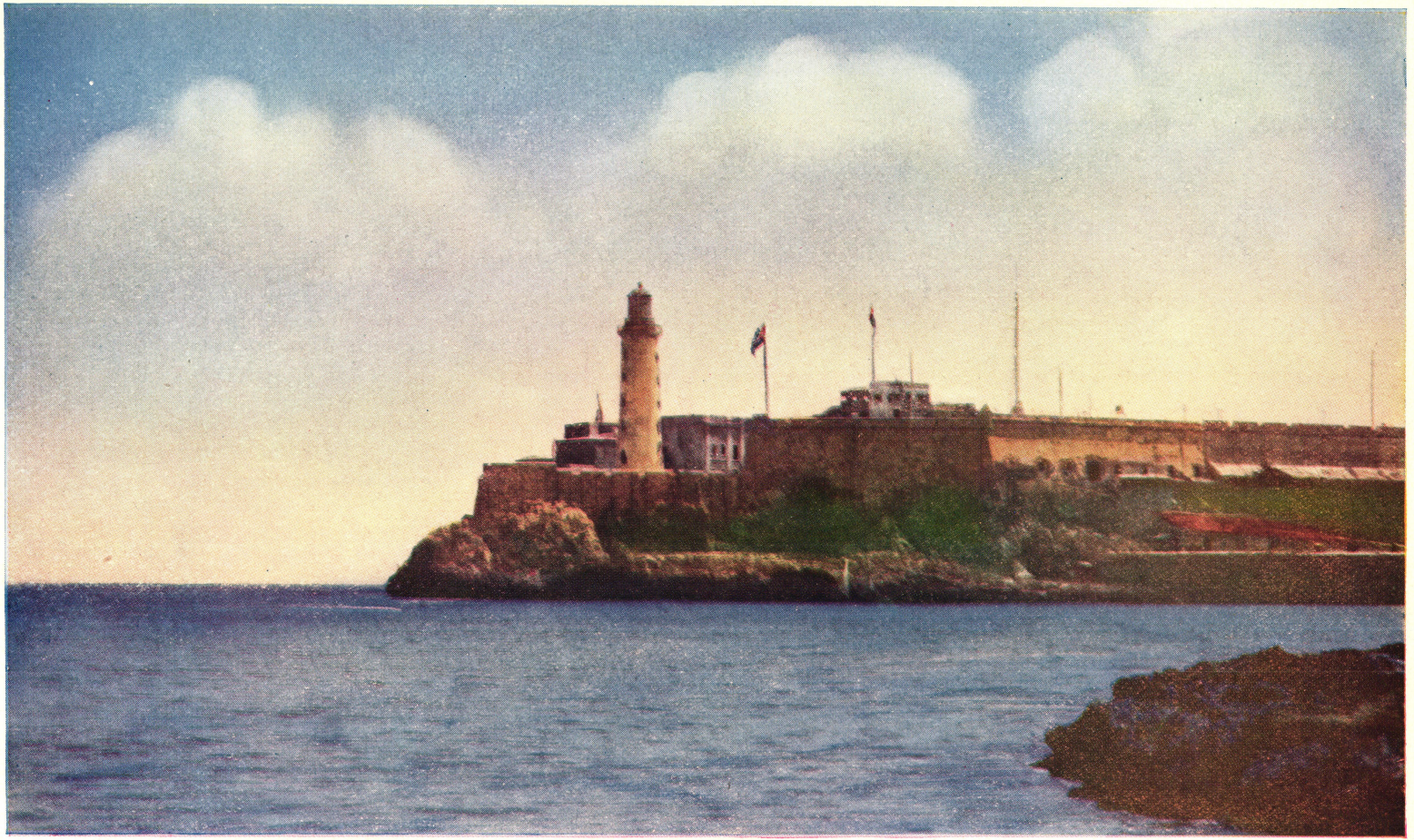
Publishers Photo Service

MANY PEOPLE BELIEVE THAT COLUMBUS WAS BURIED HERE

In 1795 Spaniards emigrating from Santo Domingo brought with them and buried in Havana Cathedral what they thought were the bones of Christopher Columbus. The remains were moved to Spain in 1898, but it is claimed that they were really those of Diego Columbus, son of the great explorer, who himself is still buried in Santo Domingo.

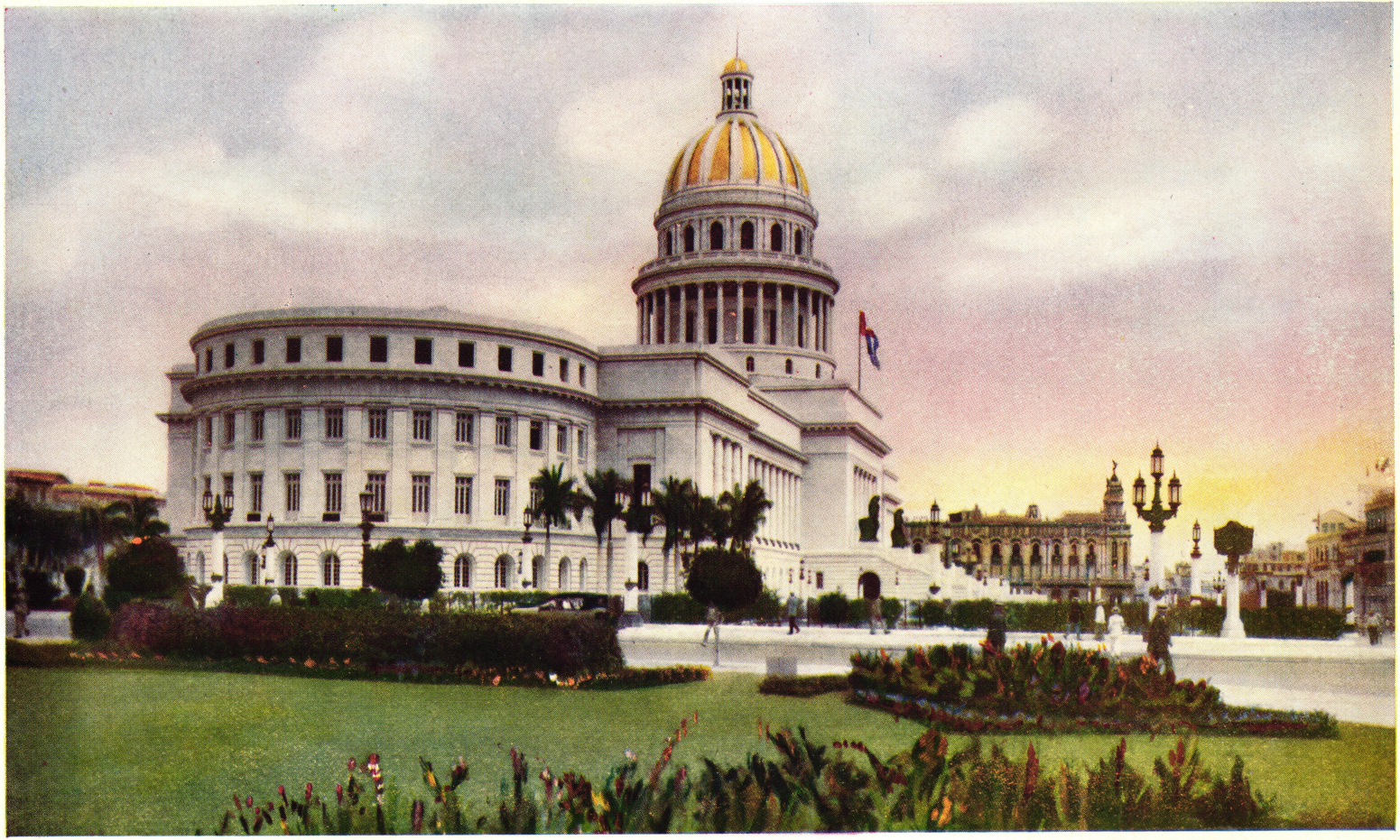
red, blue and even yellow. It is a curiously mixed town, for private dwelling houses, factories, churches, schools, convents and shops may all be found in the same street. Cigar factories are more numerous and important than any other kind.

Another valuable Cuban trade product is cabinet wood. The state alone possesses over a million acres of forest land, containing mahogany, cedar, ebony, rosewood and sandalwood; there are also logwood, lignum vitæ, the ceiba and dye-



AMERICAN PHOTO STUDIOS, HAVANA

A SYMBOL OF VANISHED EMPIRE is Morro Castle on its rock at the entrance to Havana Harbor. It is a grim reminder of the days when pirates lay in wait for Spanish treasure ships, and fortifications were built to ward off raiders and protect the galleons at anchor. To-day though the guns are still in place, the very walls of the hoary stronghold look dwarfed when a big liner enters the narrow channel. Here we see El Morro from across the harbor mouth, near the point where the famous Prado joins the curving Malecón drive.



AMERICAN PHOTO STUDIOS, HAVANA

CUBA'S NEW CAPITOL is a palatial white marble structure facing one of the many beautiful plazas in Havana. If we were to climb the wide steps and enter the doorway behind the columns, we should find broad corridors and sweeping stairways and tinted glass windows which throw soft colors on marble floors and walls. Magnificent in design and construction, the Capitol is yet but one of many fine modern buildings which give to historic Havana an air of twentieth-century splendor in pleasing contrast with its old-world charm.

woods. Many forests have been depleted by short-sighted sugar planters who burn over and clear large tracts in very wasteful fashion. The trees, shrubs, flowers and vines of Cuba offer the naturalist an apparently inexhaustible field. The variety of birds is equally bewildering. Besides many migrants from North America, the two hundred species include the mocking-bird so well known in the southern United States, humming-birds, woodpeckers, owls, parrots red and green, and brilliant little trogons and tanagers. Falcons are common and in the swamps the beautiful flamingo breeds. The turkey buzzard is seen everywhere and is protected by law. Most of the common animals like horses, dogs, goats, donkeys and cattle were brought by the Spaniards. There are plenty of snakes, but few, if any, are poisonous. The largest is the handsome python, called *maja* by the Cubans. This monster will readily dispose of a goat for its dinner, but is afraid of men. Crocodiles infest the swamps, and turtles lay their eggs in holes scooped from the sandy beaches.

On the Isle of Pines, some ninety miles due south of Cuba's narrowest part, there are few wild animals and no poisonous snakes. The plague of the place is the small sand-fly, the *jejen,* the bite of which is like the burn of a hot coal. This large island is barren in part, but in the north it is mountainous, and the scenery is exquisitely beautiful. So long ago as 1800 it was famous as a health resort, on account of its many mineral springs. Sugar-cane, coffee, pineapples, tobacco and very fine grapefruit are grown there. Being near Havana, the island is better known than some other parts of the republic, but the appreciative traveler does not wish to neglect any of Cuba's fertile provinces and famous old cities, for everywhere is found either the glamor of past happenings or the fascination of developments to come. As a nation, Cuba is still young, and those who know her best feel certain that she has a wonderful future before her.

CUBA: FACTS AND FIGURES

THE COUNTRY

Largest island in the West Indies, lying 100 miles south of the Florida Keys, with the Bahamas northeast, the Gulf of Mexico northwest, Yucatán 130 miles southwest, the Caribbean Sea and Jamaica to the south, and Haiti on the east across the Windward Passage. Length, 730 miles; average width, 50. Area, including smaller islands, 44,164 square miles. Population (estimated 1930), 3,713,767.

GOVERNMENT

A republic (*República de Cuba*) with National Congress of 2 houses, Cabinet and President. President elected for 6 years and ineligible for re-election. The United States has the right, under the Platt Amendment of 1901, to intervene under certain circumstances, and Cuba is bound to contract no excessive debts, and make no treaties threatening her independence.

COMMERCE AND INDUSTRIES

Agriculture chief industry. Sugar-cane the great crop; nearly one-fourth the total world production of sugar in 1927–28; molasses and alcohol, by-products. Tobacco crop about 65,398,000 pounds in 1929; 89,184,000 cigars and 43,562,541 pounds of unmanufactured tobacco exported. Fresh vegetables and tropical fruits exported to United States winter markets. Livestock (1929), 5,290,067. State-owned forests, 1,250,000 acres. Iron, copper, manganese, chrome, gold, coal and petroleum produced in small quantities. Cigars, cigarettes and raw sugar the principal manufactures. Chief imports: meats and lard, rice, wheat flour, cotton goods, iron and steel, machinery.

COMMUNICATIONS

Railway mileage (1929), 3,057, not counting 3,000 miles of private lines on sugar estates. Highway mileage, 1,990 in 1930 and being increased; 12,231 miles of telegraph and 214,000 of telephone wire in 1926; 9 wireless stations. Chief ports: Havana, Santiago, Cienfuegos, Nuevitas, Nipe Bay.

RELIGION AND EDUCATION

Catholicism dominant. Education free and compulsory; 449,478 children enrolled (1930) in 7,375 elementary schools under 7,301 teachers; 73 traveling teachers taught 3,458 other children. Over 525 night, private, normal and secondary schools; 1 university (Havana).

CHIEF TOWNS

Capital, Havana (Habana), 581,076; Santiago de Cuba, 48,500; Camagüey, 46,604; Cienfuegos, 39,017; Santa Clara, 26,740; Sancti Spiritus, 25,926.

THE INDIES OF THE WEST

Islands and Islanders of the Caribbean Sea

When Columbus discovered the Bahamas and Cuba he thought they were islands lying off the coast of Asia, and called them the West Indies because he reached them by sailing westward. Actually, they lie east of the American continent and guard the entrance to the Caribbean Sea. Spanish supremacy in these waters was long maintained, although challenged by the fleets of England and France. Now Great Britain, France, the United States and the Netherlands possess most of the lovely and fertile islands. But there are three republics: Cuba, about which we have just read, Santo Domingo and Haiti, of which we shall read in a later chapter. Here we are to learn something of the mixed population of the West Indies and of the now vanishing races that flourished there in the days before the coming of the Spanish galleons and adventurers from all Europe.

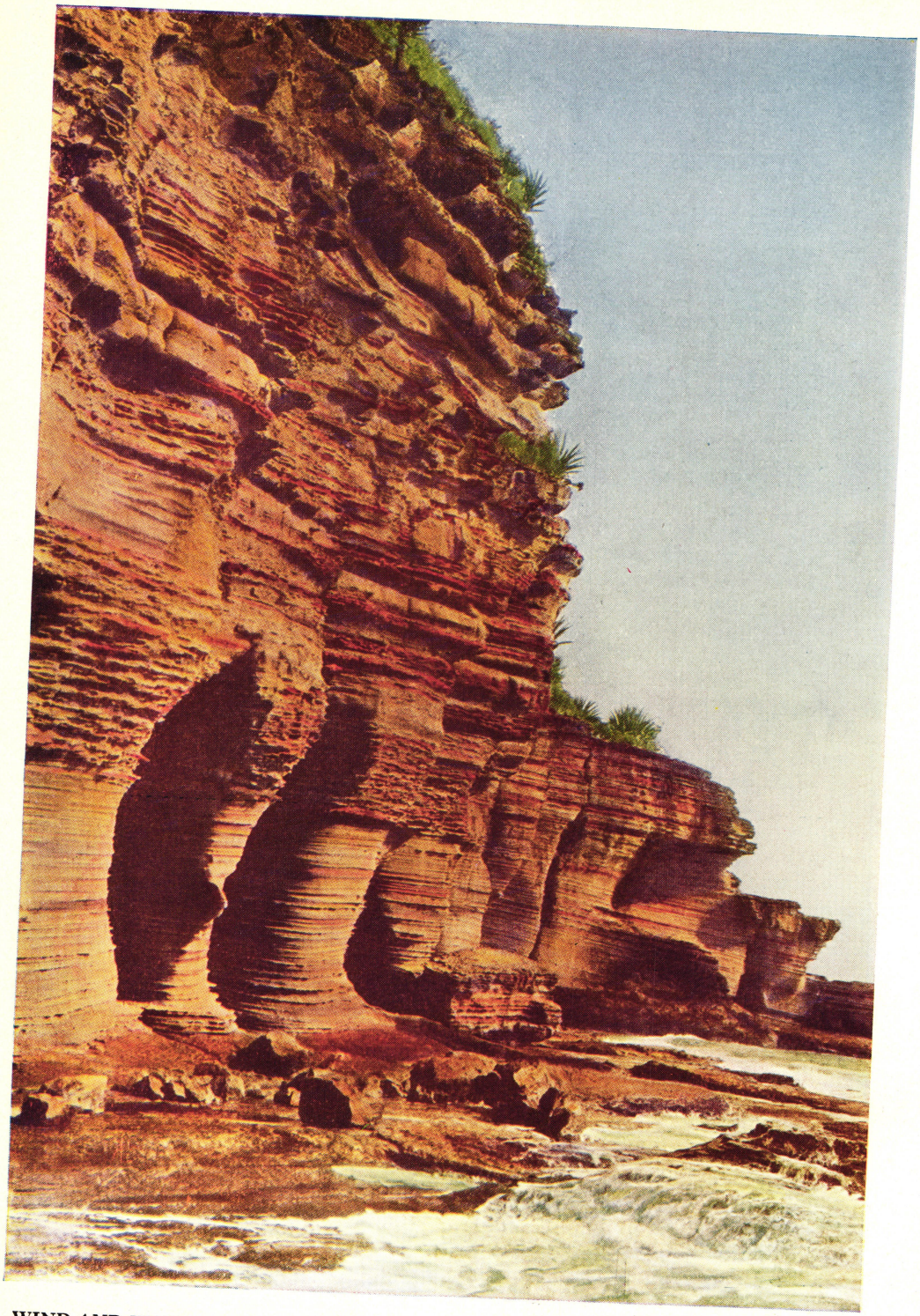
THE first glimpse of the New World that greeted Columbus after his long voyage was a West Indian island, and for the next three centuries the West Indies and the Spanish Main which lay beyond them were the constant lure and inspiration of sailor adventurers from almost every European port. Frenchmen, Englishmen, Dutchmen and Danes came to plunder Spanish ships and towns, to grow rich trading in slaves and to colonize on their own account. The fame of the rich islands attracted fortune-hunters of all kinds. Through the West Indian channels passed Sir Walter Raleigh on his search for treasure, stopping to caulk his ships with pitch from Trinidad. In many fights among their bays and creeks, Sir Francis Drake acquired that skill and seamanship which, later, defeated the Spanish Armada. The island of Tortuga, off Haiti, was the first base of the buccaneers, and at Port Royal in Jamaica they spent their plundered wealth. There is scarcely an island in the archipelago which does not recall their adventures. They have left to the Caribbean a legacy of romance.

The West Indies form a chain of islands which extends about fifteen hundred miles, from Florida to the northern shores of South America. Between the islands and Central America lies the Caribbean Sea. Cuba is the largest island; Haiti is next in size and is divided between the republics of Santo Domingo and Haiti. These two islands, which are described elsewhere, together with Porto Rico and Jamaica make up the Greater Antilles.

Stretching southward from Porto Rico to Venezuela are the Windward and the Leeward Islands, which form the Lesser Antilles. There are other islands more detached, such as Barbados and Trinidad, and the Curaçao group off the South American coast. Curaçao and its dependencies belong to the Netherlands, as do Saba and two or three other small members of the Leeward group.

Among the Leeward Isles, Antigua, Barbuda, Anguilla, St. Kitts and Nevis, Montserrat and Dominica are British. Great Britain has St. Lucia and St. Vincent in the Windwards, as well as the Bahamas, which lie to the northeast of Cuba, and Barbados. France has the Saints, Guadeloupe, Marie Galante and Désirade, all in the Leewards, besides Martinique in the Windward group. Close to Porto Rico are the Virgin Islands, a cluster divided between Great Britain and the United States. St. Thomas, St. John and St. Croix are the American ones.

In the autumn months the West Indies are liable to be swept by hurricanes. The southernmost isles of Trinidad, Tobago and Grenada, however, seem to lie outside the hurricane zone and are almost free from these devastating tempests. The name hurricane is often loosely used for any great storm of wind, but the violent movement of the air in a real West Indian hurricane is always of a twofold character. The wind rushes round in a great swirl or circle at from thirty to one hundred and fifty miles an hour; the circle



EWING GALLOWAY

WIND AND WATER were the untiring sculptors who carved these great cliffs at Antigua into massive columns known as the Pillars of Hercules. Antigua, one of the British West Indies, is a small island in the Leeward group. Much of its shoreline is rocky and beautiful, and inland the countryside is green with palms and fields of sugar-cane.

THOMAS F. LEE FROM EWING GALLOWAY

STRAW HATS IN THE MAKING are but one of the many colorful sights to be seen in picturesque Willemstad, the capital of Curaçao in the Dutch West Indies. The houses have high gables and steep tiled roofs like those of a Dutch city, and here and there in the streets blonde Dutchmen are conspicuous among the many black and brown faces.

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NEGRESS OF JAMAICA TAKING HER WARES TO MARKET

Most of the Negroes in the West Indies are the descendants of slaves who were brought to the islands from the days of Drake and Hawkins until the horrible slave trade was abolished in 1807. They lead a cheerful, carefree plantation life, and the women carry everything on their heads, a habit which makes them stand very straight and walk very gracefully.

measures anything from one hundred to five hundred miles in diameter. The storm, with its calm centre and its furiously raging circumference, takes a vast curved course until its force has been exhausted.

Hurricanes which strike the West Indies in the neighborhood of the Windward or the Leeward Isles often start near the Cape Verde Islands and are drawn westward across the Atlantic and the Caribbean. They generally sweep the Lesser Antilles and one of the larger islands, but as a rule miss Cuba. Then they either turn sharply northward up the coast of the United States and swing back into the Atlantic, or else keep on across the Gulf of Mexico. The records of the September storms for forty years show that their normal course takes them over the peninsula of Florida, and it was one of these that demolished Miami in September, 1926.

The terrible hurricane of 1928 devastated Marie Galante, Guadeloupe, Montserrat, St. Croix, Porto Rico, Turks and Caicos Islands, the Bahamas and large

areas in Florida. The loss of life was appalling and the damage ran into many millions of dollars. Hurricanes seldom arrive without due warning, for the United States maintains a highly efficient weather bureau in the West Indian area, which signals the movements of approaching storms to the different islands.

At the end of the fifteenth century, when the West Indies were discovered, they were inhabited by two races very different both in temper and appearance. The Arawaks, a gentle and peace-loving people, occupied the islands of the north; the fierce and warlike Caribs resided in the smaller islands and waged relentless war on all newcomers, as well as on their neighbors. Not many descendants of the aborigines remain. From the name of the ferocious Carib tribe the English language obtained the word "cannibals," as a general term for man-eating savages. A curious habit of both Arawaks and Caribs was to change the natural shape of their babies' heads by compressing the skull. The Arawaks flattened the forehead, and the Caribs squeezed it on each side, making it high and square. The Arawaks were very badly treated by the Spaniards, who enslaved and finally exterminated them. The Caribs, armed with bows and arrows, fought desperately against the Spaniards, French, English and Dutch, one after the other, and in some of the islands managed to hold their own for quite two hundred years.

Every shade of color is found among the people of West Indian birth. Black

Leader

NEGRO YOUNGSTERS BASKING IN CARIBBEAN SUNSHINE

These boys are expected to help earn the family living at an early age, but they are past masters in the art of idling, and are generally absent when there is work to be done. Their fathers will work on the plantations or elsewhere for a few days, and then, having made a little money, will lead a life of ease for a while.

© E. N. A.

ST. THOMAS, CAPITAL OF THE VIRGIN ISLANDS

The islands of St. Thomas, St. John and St. Croix were Danish possessions until 1917, when they were bought by the United States of America. The city of St. Thomas used to be called Charlotte Amalie. The town is built on four hills so steep that there is little wheeled traffic, and many of the streets consist of steps or narrow paths up the hillsides.

© Underwood & Underwood

STRAW HATS FOR SALE IN A STREET OF YAUCO, PORTO RICO

Porto Rico is the largest West Indian island belonging to the United States, and in its valleys many tropical crops are grown. The chief articles of export are sugar, fruit, coffee, cigars, cigarettes and loose tobacco, besides fine needlework and the beautifully woven straw hats shown here. Yauco is near the south coast, on the railway that almost circles the island.

© E. N. A.

AT HARVEST TIME THE NEGROES OF JAMAICA CUT THE CANES WITH LONG, SHARP MACHETES

The sugar-cane, which is now grown in nearly every tropical country in the world, is really native only to India and Malaya. It did not reach America until after 1500, taking Egypt, Sicily, Spain, Madeira and the Canaries as steps in its great westward journey. Cuba and the other West Indian islands now grow almost a third of all the cane-sugar that the world uses. In Jamaica the roots are planted, the young canes tended, and the harvesting done by Negroes—people originally as foreign to the place as is the sugar-cane itself.

© E. N. A.

EAST INDIANS AT WORK IN THE DRYING SHEDS OF A WEST INDIAN CACAO PLANTATION

Since the abolition of slavery early in the nineteenth century, large numbers of East Indians have come to the British West Indies to work on the plantations. They have replaced Negro laborers on many of the estates, especially in Trinidad, where they form nearly one-third of the population. The East Indians preserve all their ancient customs in these islands of the West. In the photograph we can see the drying-houses, with their sliding roofs pushed back and piles of cacao beans spread out in the hot sun. At night the roofs are slid into place again.

Elders & Fyffes, Ltd.

GATHERING THE BANANA CROP ON A WEST INDIAN PLANTATION

On the right is a Negro holding a long pole at the end of which is a knife. With this he nicks the stalk of the bunch so that it bends down until the other man carefully catches it; the stem is then cut with a sharp, heavy knife. Bananas are gathered when they are green, and a single bunch may weigh from fifty to seventy pounds.

men, brown men, red men, yellow men and white men are all to be seen here. There are mulattoes, who are half-Negro and half-Caucasian; quadroons, who are three-quarters white; and octoroons who have very little Negro blood. There are pure-blooded Negroes who are descended from the slaves imported from Africa in great numbers years ago, East Indians whose parents were brought in as laborers when the slave trade was abolished, and others who have come in since as colonists. Quite a few Chinese are to be seen. There are also the Spanish, British, French, Portuguese, Dutch and Danish settlers, and many North Americans.

The West Indian Negroes are a curious mixture of simplicity and of intelligence. The typical Negress of Barbados is thus pictured by Sir Frederick Treves:

"She has well-molded limbs, [and] perfect teeth. . . . The carriage of her head and the swing of her arms as she walks along the road are worthy of the gait of queens.

"She is as talkative as a parrot, her smile is that of a child at a pantomime, and without her this island would lose half its picturesqueness. She works hard and is strong. Her habit is to carry everything, whether large or small, on her head. I have met an old woman carrying a full-sized chest of drawers in this way, and accompanying her a young housewife, with a single slice of green melon on the black mat of her hair."

The women love bright colors. They are seen at their best in their white or striped cotton dresses, with a colored turban, or madras, artistically wound about the head. In some of the islands the madras is fashioned on a stiff paper "shape," so that it can be put on and off without any disarrangement of its folds. People who have lived some time in the West Indies can tell from which island a black woman comes as much from the fashion of her headgear as from the particular dialect she speaks.

On the plantations and estates the Negroes go about barefooted and very lightly clad, but they are particular to appear in their best clothes when they go into town. A planter in the hills cannot send one of his men on an errand to the town and expect him to come back with a reply on the same day. The man invariably goes home on the way to change into his Sunday best, because he hates to be seen among the shops and offices in his working-clothes. If you walk down to the port, you will very likely pass a group of women by the roadside busily putting on stockings and high-heeled shoes. They also are going to the town, and have stopped a little way outside to dress before they reach the streets. They will stop again at the same place on their way

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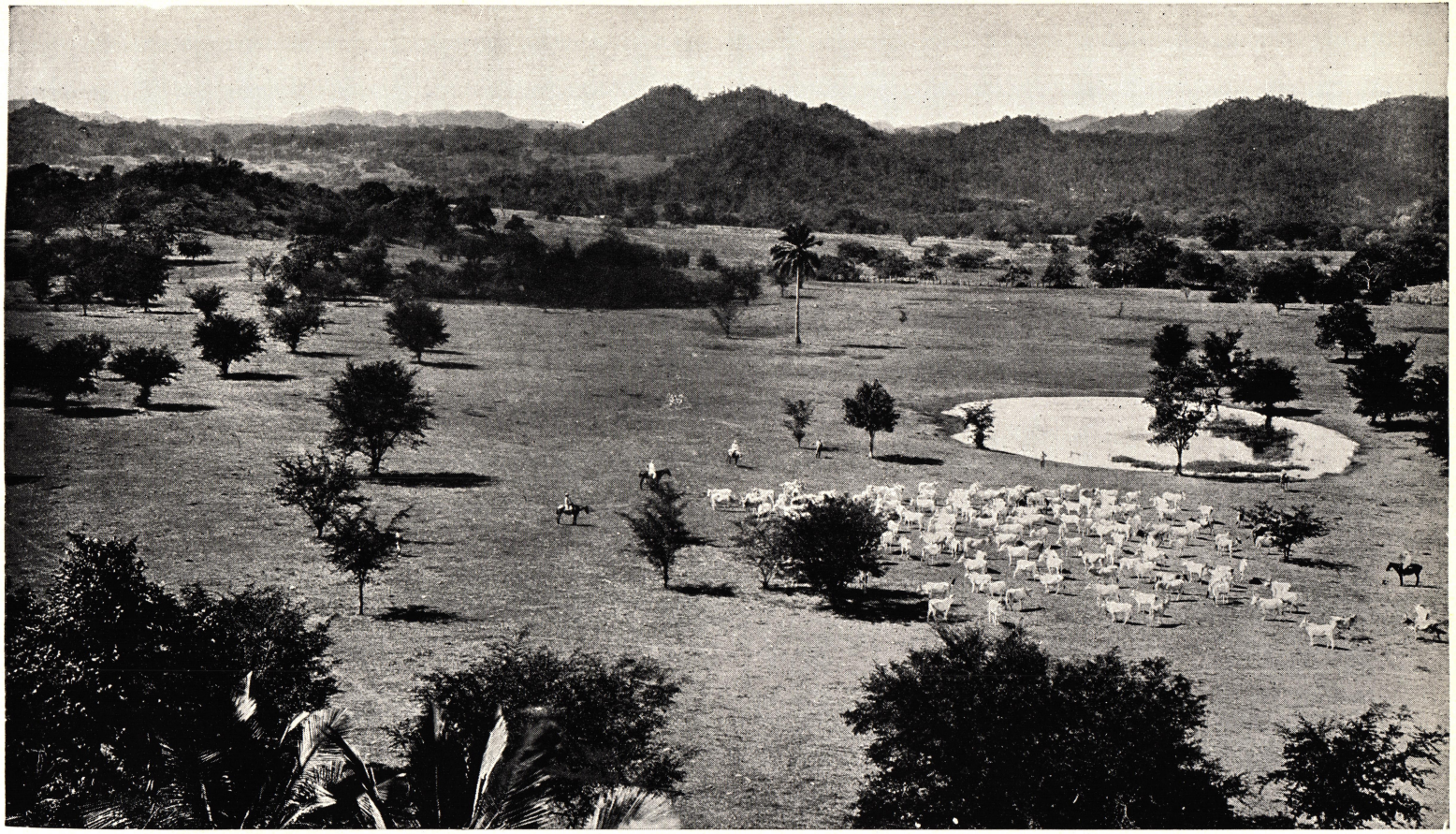
OPENING PODS OF THE CACAO TREE TO EXTRACT THE SEEDS

Cocoa, or more correctly, cacao, is a product of many West Indian islands, and here we see men cutting open the oval yellow pods and removing the pulp from the beans, which are dried as we see on the opposite page. When cleaned, roasted and ground, they are then ready to be made into cocoa or chocolate.



Jamaica Govt.

HERD OF EAST INDIAN CATTLE GRAZING ON THE PASTURE LANDS OF BEAUTIFUL JAMAICA

When the Spaniards colonized Jamaica they introduced Spanish breeds of cattle that provided inferior meat but were useful as draught animals. The British improved the stock by importing animals from England, but it has been found that a mixed breed, crossed with Mysore cattle brought from India, thrives best on the island. Jamaica is well-watered and suited to stock-raising, but as its soil is very rich, agriculture is more important. This photograph shows some of the beautiful country around Montpelier, in the northwest of Jamaica.

Jamaica Govt.

WONDERFUL BAMBOO AVENUE NEAR THE VILLAGE OF LACOVIA

Jamaica is among the most beautiful of the West Indian islands. It contains hills clad with forests to their topmost peaks, rolling pastures, fairy-like vales and charming roads such as the one we see here. Columbus called the island St. Iago, but the Indian name seems more appropriate, for Xaymaca, or Jamaica, means "land of springs and streams."

Thos. F. Lee from Ewing Galloway

LIGHTING THE LAKE

Trinidad has both asphalt and petroleum deposits, and natural gas bubbles up from beneath the surface of the asphalt lake so freely that it can be ignited with a match.

back, take off their finery and make a bundle of it to carry home on their heads.

The black people are sunny and good-tempered; they are not too particular in matters of strict honesty and truth, but are faithful, and devoid of malice. Trouble sits upon them lightly, and they are all fond of music. The languages they speak include every imaginable variation of French, English and Spanish.

All sorts of delicious fruits and unexpected kinds of fish and vegetables make up, with chickens and guinea-fowl, the West Indian's daily fare. Green oranges and grapefruit, the tiny bananas known as "lady's fingers," mangoes, pineapples and grenadillas, guavas, pomegranates and the avocado pear are a few of the luscious products of the islands.

Flying-fish and "oysters grown on trees" are often on the menu. The oysters are picked off the roots of mangrove trees to which they cling. In Dominica and St. Kitts "mountain chicken" is a special delicacy. This is really the crapaud, or web-footed frog. Yams, cassava and other vegetables grow profusely.

The chief product of the West Indies as a whole used to be cane sugar. After the abolition of slavery, the profits from the sugar plantations dwindled seriously, but are now of increasing importance once again. Molasses and rum are by-products wherever raw sugar is manufactured. The depression in the sugar industry had the good effect of stimulating other lines of agriculture. Two of the most important industries which have developed within recent times are the growing of bananas and of cacao. To Jamaica, especially, the popularity of the banana has proved of great significance, as the island exports twenty million or more bunches every year. Dominica, Montserrat and St. Lucia have developed the lime-growing industry. Other valuable products of the West Indies are coffee and coconuts, citrus fruits, pineapples, spices, copra and tobacco.

Barbados, St. Vincent and Antigua are famous for their cotton, which is called "sea-island" cotton. Nutmegs and arrowroot, logwood for dyeing and mahogany for furniture are other commodities produced, while the Bahamas export sisal hemp and sponges. Most of these are vegetable products, and it is only in Trinidad that mineral deposits in the form of petroleum and asphalt contribute substantially to the island's wealth.

The Virgin Islands are known for the bay rum manufactured there. Its chief ingredient is oil from the leaves of the bay trees which grow wild on the tiny island of St. John. After the twigs have been picked, the leaves are distilled and the oil sent over to St. Thomas to be made into bay rum. The St. Thomas product is considered the best on the market. St. Croix, largest of the Virgin group, specializes in sugar and cattle.

Besides the three main islands, and without including the thirty belonging to Great Britain, there are nearly fifty tiny islets in the group. They have not always belonged to the United States, and their history has been very checkered. Columbus sailed into this miniature archipelago on his second voyage, and rather than think up a name for each individual

island he christened them collectively for the virgins who were martyred with St. Ursula. As the martyrs were said to number eleven thousand, this allowed plenty of names and to spare. For many years no settlements were made, then the various European powers who had holdings in the Caribbean began to disagree about the ownership of the Virgins. Spaniards, British, French, Dutch and Danes all controlled some part of the group at one time or another. England and Denmark finally divided the islands and in 1917 the United States purchased the Danish ones.

The West Indian islands are of two distinct types—coral and volcanic. Barbados and Dominica present this contrast strikingly. Barbados is a coral island and therefore comparatively flat; Dominica is of volcanic origin, with mountains rising to five thousand feet. When Queen Isabella of Spain asked Columbus to describe Dominica, he is said to have crumpled up a piece of parchment and dropped it on the table before her. The average annual rainfall there is very high, and roads and bridges are likely to be washed away by the torrents as fast as they are made. This island claims to have 365 rivers, one for every day in the year. Many of them pour down to the sea through wild and beautiful forest valleys. Barbados, on the other hand, has smooth level roads and good hotels, and almost every part of it is cultivated.

Jamaica is the largest British island in the West Indies. Lying south of Cuba, its towering peaks can be seen far out at sea. If, like Columbus, one approach it in May when the pimento or allspice tree is in bloom, the air will be filled with spicy fragrance. Jamaica was discovered in 1494, and colonized by the Spaniards in 1509. They kept it for about 150 years, when it was taken by the British, and British it has remained ever since.

Kingston is now its capital. For a long time Port Royal was the chief town, but it owed its importance rather to the buc-

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NEGRO LABORERS WORKING ON TRINIDAD'S HUGE PITCH LAKE

The famous Pitch Lake furnishes annually more than 230,000 tons of asphalt for road-making. It has an area of about 110 acres and its depth is unknown. Each morning the trench made the day before is found to be filled up again by the pressure of the vast mass from underneath. The rails gradually sink and have to be relaid periodically.

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SMILING MEMBER OF MARTINIQUE'S MULATTO POPULATION

Martinique in the French West Indies is a very beautiful volcanic island which has suffered much from earthquakes, hurricanes and eruptions. Most of its people are mulattoes, or creoles—to use the island term. The women are very graceful, and are fond of wearing brilliantly colored clothes. They take life easily and refuse to be downcast by disaster.

© E. N. A.

BEAUTIFUL PALMS IN BRIDGETOWN, THE CAPITAL OF BARBADOS

Barbados is one of the Windward group and is farther east than the other West Indian islands. It has an area of 166 square miles and is one of the most densely populated places in the world, but the soil is so fertile that it easily supports its 170,000 inhabitants. Barbados produces large quantities of sea-island cotton and is especially noted for its sugar.

J. O. Sands, Nassau

PALMS LINE THE GLEAMING CORAL BEACH AT NASSAU

When northern lands are shivering in the grip of snow and sleet, the Bahamas are like a veritable tropical paradise. Here at Nassau, the capital, the water is warm and unbelievably blue, so that the sand looks whiter and the palm leaves greener, by contrast. This beach seems ideal, sheltered as it is by the jutting coral reef.

caneers, who made it their headquarters, than to peaceful citizens or traders. There Sir Henry Morgan collected ships and crews for his famous expeditions against Porto Bello, Maracaibo and Panamá, and at Port Royal his desperadoes squandered their loot. When he became governor of Jamaica he hung those of his comrades who kept on buccaneering without his permission, but still the city gloried in its reputation for wealth and wickedness, until it was destroyed by an earthquake in 1692. Kingston was founded the next year by the survivors.

Earthquakes of great severity occur in the West Indies at long intervals. A terrible one devastated Kingston itself in January, 1907. It was a hot, sunny afternoon; suddenly there was a sound like the wind whistling, followed by a roar and rumble like a mighty avalanche. The ground was rocked violently, people were thrown out of windows and through doors, then down came buildings and houses, crashing thunderously and sending up a black dust which hung like a pall over the city. In a short time fire had started to complete the ruin. Happily such a disaster is a very rare occurrence, and the new Kingston is now a thriving city.

Much of the beauty of Jamaica lies in its wonderful colors; flowering shrubs of brilliant scarlet, yellow or white and masses of rich green trees add to the beauty of the landscape. Waterfalls are numerous and the lovely Blue Mountains rise to a height of seven thousand feet. When the Río Cobre is in flood, its waters gleam like bright new copper, hence its name—the Copper River. For the grandeur of its scenery, Jamaica is well called the Queen of the Caribbean.

Porto Rico, the most important ter-

ritory of the United States in the West Indies, is not so famed for scenic beauty as Jamaica. Its mountains are lower and its vegetation less luxuriant. But it is an exceedingly fertile island and easily supports a dense population, the majority of whom are white. It came to the United States as a result of the Spanish-American War. Porto Rico was early settled by Spaniards from Santo Domingo. The massive walls and castle of San Juan were built by Ponce de León, one of the most famous of the conquerors. His white house still stands on the wall above the harbor from which he sailed on his search for the Fountain of Youth. The Indians said this marvelous spring would make an old man young again. Ponce de León, however, found in the wilds of Florida not youth but a mortal wound, and died in Havana on his way back.

Like Cuba, Porto Rico makes sugar and tobacco its most important crops. All the low coastal lands are cultivated as canefields and the larger plantations maintain great centrals, or mills, for grinding the cane. The steep hillsides are covered with cheese-cloth "tents" which protect the tobacco plants. Some Porto Rican cigars are almost as fine as the choice Havana product. Besides these two traditional crops, coffee, grapefruit, pineapples, cocoanuts and oranges are normally produced in large quantities. But the frightful hurricane of 1928 did enormous damage to crops of all kinds. The coffee plantations were badly crippled, and the grapefruit growers alone suffered a loss of ten million dollars. Half the houses in San Juan lost their roofs, trees were snapped off and debris filled the streets. Peasant homes were leveled to the ground, and the Red Cross fed five hundred thousand people. This disastrous storm greatly retarded the

Ewing Galloway

SABA'S COAST IS NO PLACE FOR LANDLUBBERS

There is not a single good harbor on this rocky little Dutch island, which consists of an extinct volcano rising abruptly out of the Caribbean. The one town is called Bottom, because it is down inside the old crater, and is reached by steps cut in the rock. Yet the best boats in the West Indies are made there, and laboriously hauled up the steps and down to the sea below.

Ewing Galloway

BOTH SPANISH AND ENGLISH ARE NECESSARY IN SAN JUAN

The capital of Porto Rico is one of the oldest Spanish cities in the New World, but it has acquired many North American characteristics since the island passed into the hands of the United States. The signs indicate plainly the mixture of tongues, and the drug store in the lower right-hand corner hangs out a shingle in both Spanish and English.

© Burton Holmes from Ewing Galloway

A CAMERA ALWAYS DRAWS A CROWD

Here the entire membership of a little Porto Rican country school outside San Juan has collected at the sight of the camera-man. There are all ages, all sizes and all complexions, well exemplifying the racial mixture on the island. Education has been strenuously pushed ever since Porto Rico became American, and the rural schools are carefully organized.

Ewing Galloway

THE LAST WORD IN SCHOOL BUILDINGS

This beautiful big San Juan high school looks very palatial alongside the tiny rural school shown above. It is ultra-modern in every detail, and the courses of instruction are no more old-fashioned than the concrete construction of the building. Co-education is the rule on the island, not only in the lower schools but in the University at Rio Piedras.

© E. N. A.

PEACEFUL HARBOR AT FORT-DE-FRANCE, CAPITAL OF MARTINIQUE

Fort-de-France is the chief town on the enchanting island of Martinique, and is about fifteen miles southeast of St. Pierre, which was destroyed by the eruption of Mt. Pelée in 1902. Fishing boats and coastal steamers use this part of the harbor, while big liners such as the one we can see in the distance must anchor farther out.

fight against disease carried on ever since the United States acquired Porto Rico. It also damaged or destroyed over half the schoolrooms, thus hindering the important educational work which steadily decreases the percentage of illiteracy. With financial aid from the United States, Porto Rico is recovering from its losses more quickly than people at first dared to hope.

One great need of the West Indies is better and more frequent communication between the different islands. In these days of easy and quick travel, they might be used far more as winter resorts than they have been yet. Tennis, golf and cricket are very popular, and fishing provides excellent sport. Tuna and tarpon fishing are especially exciting. In the larger islands the roads are excellent for motoring. Tropical scenery of wonderful variety can be enjoyed with complete freedom from many tropical discomforts; the warmth is tempered always by sea breezes, and there are few dangerous reptiles. Gorgeous butterflies and hummingbirds and wonderfully colored orchids abound. Whether one goes to historic San Juan in Porto Rico, to delightful St. Kitt's or green St. Croix in the Lesser Antilles, to lovely Jamaica or the coral islets of the Bahamas, one may enjoy all the pleasures and the rich, luxuriant beauty of the tropics.

THE WEST INDIES: FACTS AND FIGURES

The archipelago is roughly an arc extending from Florida to the Venezuelan coast, between the Caribbean Sea and the Atlantic Ocean. Cuba and Haiti (treated elsewhere), Porto Rico and Jamaica make up the Greater Antilles; the Lesser Antilles are divided into the Leeward, Windward and Curaçao groups; Barbados and the Bahamas are separate.

THE BAHAMAS (British Colony)

Over 40 small islands east of Florida and north of Cuba and Haiti; 20 are inhabited. Area, 4,404; population (1930), 60,848. Capital, Nassau (New Providence Island), 12,554. Administration: Governor, Executive Council, Legislative Council and representative Assembly. School enrolment (1927), 11,198. Products: sisal hemp, sponges, lumber, fresh tomatoes, shells.

BARBADOS (British Colony)

Lies east of the Windward Islands; area, 166; population (1929), 170,391. Capital, Bridgetown, 13,486. Administration: Governor, Executive Council, Executive Committee, Legislative Council, elected House of Assembly. School attendance (1927), 14,649. Imports: cotton goods, flour, rice and other foodstuffs, fertilizers, coal, iron and steel products. Exports: sugar, molasses, rum, cotton.

CURAÇAO (Dutch Colony)

Three islands (Curaçao, Bonaire, Aruba) off the Gulf of Maracaibo and 3 in the Leeward group. Area, 403; population (1927), 61,479. Capital, Willemstad (Curaçao Island), 19,061. Administration by a Governor and 2 appointed councils. 9,064 school children, 1927. Products: corn, beans, pulse, cattle, salt, phosphates; chief industry, oil-refining.

JAMAICA (British Colony)

Lies 90 miles south of Cuba. Area (with adjacent Cayman Islands and Turks and Caicos Islands in Bahama group), 4,674; population (1929), 994,419. Capital, Kingston, 62,707. Administration: Governor, Privy Council and partially elective Legislative Council. School attendance (1927), 76,990. Imports: cotton goods, flour, fish, shoes, gasoline, coal. Exports: bananas, sugar, molasses, coffee, pimento, coconuts, logwood and extract, cacao, copra, ginger, oranges.

LEEWARD ISLANDS

Over 25 islands southeast of Porto Rico. Anguilla, Antigua, Barbuda and Redonda, Dominica, Montserrat, St. Kitts (St. Christopher) and Nevis, also Angegada, Tortola, Virgin Gorda and all but 3 of the other Virgin Islands are British. Governed as one colony by a Governor, an Executive Council and a Legislative Council. Area, 715; population (1929), 124,965. Capital, St. John (Antigua), 6,977.

Désirade, Guadeloupe, Les Saintes, Marie Galante, St. Barthélemy and half of St. Martin are French, and governed as one colony by a Governor and an elected Council, with representation at Paris. Area, 688; population (1926), 243,243. Capital, Basse-Terre (Guadeloupe), 8,379.

Saba, St. Eustatius and half of St. Martin are Dutch, governed with Curaçao.

St. Thomas, St. John and St. Croix in the Virgin Islands belong to the United States; administration: Governor and 3 partially elective Colonial Councils; character, property and residence qualifications for franchise. Area, 132; population (1930), 22,012. Capital, St. Thomas (on St. Thomas), 7,036.

Chief products of the Leewards: sugar, molasses, rum, cacao, coffee, cotton, tobacco, lime juice and citrate of lime (Dominica and Montserrat), bay rum (U. S. Virgin Islands).

PORTO RICO (United States Territory)

Lies 45 miles east of Haiti; area, 3,435; population (1930), 1,543,913. Capital, San Juan, 114,715. Administration: Governor, elected Legislature of 2 houses; franchise restricted to U. S. citizens, including women who can read and write; represented in Congress by 1 Commissioner. School enrolment (1928), 220,940. Imports: meats, rice, flour, cotton goods, petroleum products, iron and steel, machinery, fertilizers. Exports: sugar, molasses, grapefruit. oranges, pineapples, coconuts, cotton, coffee, tobacco.

TRINIDAD AND TOBAGO (British Colony)

Trinidad (1,826 square miles) lies just north of the Orinoco delta, with Tobago (114) on its north. Population (1929), 403,725. Capital, Port of Spain (Trinidad), 67,877. Administration: Governor, Executive Council, partially-elected Legislative Council; franchise extended to women over 30. 288 elementary schools 1927. Imports: flour, rice, machinery, cotton goods, vehicles. Exports: asphalt, petroleum, cacao, copra, coconuts, sugar, coffee.

WINDWARD ISLANDS

Small group lying south of the Leewards. Granada, St. Lucia and St. Vincent form a British colony under one Governor and each has its partially-elected Legislative Council. The Grenadines (about 12 islets) are divided between Grenada and St. Vincent. Area, about 516 square miles; population, 1929 (partly estimated), 185,394. Capital, St. George's (Grenada Island). Products: cacao, nutmegs, mace, cotton, sugar, molasses, rum, copra, peanuts, arrowroot (St. Vincent), lime juice and oil (St. Lucia), honey, hides, logwood.

Martinique is a French colony under a Governor, a Privy Council and elected General Council, with representation at Paris. Area, 385; population (1927), 234,695. Capital, Fort-de-France, 26,399. Products: sugar, rum, cacao, coffee, tobacco, pineapples, bananas.

Publishers Photo Service

TO FOREIGN EYES THE MARKET WOMAN IS AS INTERESTING AS THE POTTERY SHE SELLS

This Haitian market woman has come from the hills to sell her wares in the Cathedral square at Port-au-Prince. She may have traveled fifteen or twenty miles, her merchandise carefully packed in the panniers of her donkey. The potters make every sort of water-jar, pitcher, jug and bowl needed to fill the requirements of peasant life, and their handiwork often has graceful lines. The reddish-brown of the earthenware makes an effective background for the woman's bright blue calico dress and dark skin. Her bandanna is rose-colored and her hat is of yellow straw.

THE CRADLE OF THE NEW WORLD

Two Nations Share the Land Columbus Loved

The island of Haiti, lying between Cuba and Porto Rico, is not only the second largest of the West Indies, but one of the richest, most mountainous and most beautiful. Its misty peaks tower nine or ten thousand feet above the blue Caribbean. Rich forests cover the mountains, all kinds of tropical plants grow in the fertile valleys and mineral wealth awaits development. Columbus saw the value of the island, and established there the first Spanish colony. It is now divided between the Republic of Haiti in the west and the Dominican Republic in the east. Both countries have been troubled by revolutions and financial difficulties which have more than once provoked foreign intervention. Now Haiti is virtually a protectorate of the United States, which also administers the finances of the Dominican Republic.

BEAUTIFUL, mysterious Haiti, with its two restless little republics and their contrasting populations, has had a history as bizarre and topsy-turvy as any island in the turbulent West Indies. It was discovered by Columbus on his first voyage, and called Hispaniola — "Little Spain." Attracted by the gold the Indians displayed, he immediately planted colonies, and the city of Santo Domingo was the first permanent white settlement in the New World. When the Indian population had succumbed to persecution and forced labor, the mines and sugar plantations were worked by African Negroes whom the slavers transported. But with the discovery of riches on the mainland Hispaniola lost its importance. In the seventeenth century French buccaneers from Tortuga seized upon the western part we now call Haiti, and made of that a wealthy French colony. The eastern portion, Santo Domingo, remained in Spain's possession until 1795.

Haiti's prosperity was built on the sufferings of over-worked slaves, and when news of the French Revolution reached the island the blacks rebelled. Inflamed by their sufferings and led by a remarkable Negro, Toussaint L'Ouverture, the slaves fought bravely and were everywhere victorious. Although Toussaint had been a slave he was well educated. He showed himself a skillful general and a great leader. All Haiti was in his power when Napoleon sent an army which seized the strongholds and captured Toussaint by treachery. He died a prisoner in France, but his fierce lieutenant, Dessalines, renewed the struggle and after bloody fighting finally drove the French from the land in 1803.

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SIMPLE LAUNDRY IN HAITI

Like women in many other parts of the world, the Haitian housewife only requires running water and two flat stones, and she will set up quite an adequate laundry.

Two rulers then divided Haiti between them—Christophe in the north, and Pétion in the south. Christophe maintained a punctilious, magnificent court at Sans Souci, his beautiful palace, where white men were forbidden to come. He was a forceful man, obsessed with the idea of making Haiti strong enough to resist another French fleet. In the jungle at Cap Haitien stands the fortress of La Ferrière, which he raised as a last resort against invasion. Built with incredible toil three thousand feet high upon the steep mountain crest, the citadel's ponderous walls and useless cannon look out over the valleys and ranges of Haiti. It is now a deserted yet majestic ruin.

Haitian rulers usually had short but exciting careers, and revolutions came to be a habit. Finally in 1915 President Guillaume Sam was chased from his palace by revolutionists and took refuge in the French Consulate. When it was learned that two hundred political prisoners had been executed by his orders, he was dragged outside and killed in front of the building. To avoid European intervention and to maintain order, the United States landed a small force of marines and established a virtual protectorate over the republic. This supervision has, in the face of much opposition, been of material benefit to Haiti. The Americans have trained a reliable police force, built over nine hundred miles of good roads and greatly improved public sanitation. They are putting capital into railroads and sugar mills. Production of cacao, sugar, tobacco and cotton is on the increase. Haitian coffee is excellent, just as it was

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ON THE ROAD TO MARKET IN THE HAITIAN REPUBLIC

Every Saturday the peasant women flock into the market towns. Many carry their wares balanced on their turbaned heads; others, like this woman, ride between the loaded panniers which almost eclipse diminutive donkeys. The trip is the great excitement of the week, and they will walk all the way to town rather than sell their produce on the road.

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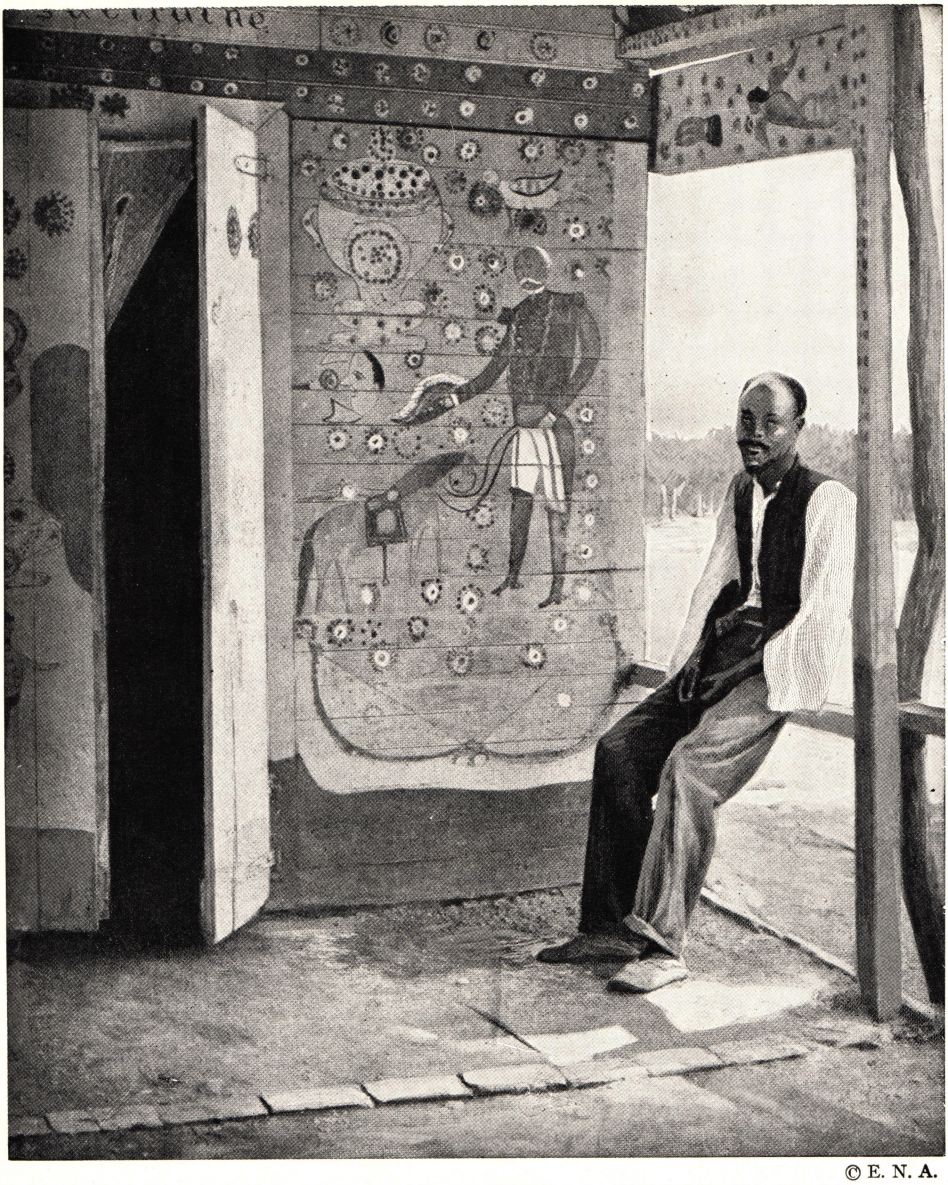
CROWDED SQUARE BEFORE THE CATHEDRAL IN PORT-AU-PRINCE

Port-au-Prince is a hot seaport town with a population of 100,000, and on market days the Cathedral looks down on a noisy colorful crowd collected from the countryside for miles around. Dark-skinned peasant women in bright red or yellow turbans and indigo-blue dresses sell fruits, vegetables, wooden dishes, earthenware jars and jugs.



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CRUDE DECORATIONS OF A VOODOO TEMPLE IN HAITI

The Haitians are Roman Catholics, but with their Christianity the peasants mingle remnants of Voodoo beliefs brought from West Africa by their ancestors, the slaves who were imported first by the Spanish and then by the French. The priests and priestesses still have influence in spite of all efforts to end Voodoo.

in the days of the French planters. The schools are helping to form a more enlightened generation of peasants, who will know how to help develop their country's valuable agricultural and mineral resources.

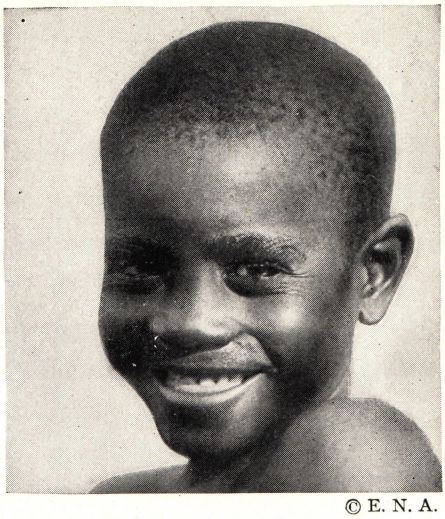
The capital is Port-au-Prince, a spacious town where the dazzling white houses are surrounded by mango, orange and palm trees. Creole, a debased form of French, is heard everywhere. Upper-class Haitians—lawyers, scholars or writers—speak pure French, and are usually educated in Paris. Thus Port-au-Prince and one or two other coast towns contain little centres of European

culture very different from the peasant life around them. France still dominates the life of the educated classes intellectually if not politically, but the heritage of the country folk is wholly African.

The Haitians of the interior are a lazy happy people, who delight in the dreamy life. The tropical sun saps their energy, and for food there is always an abundance of fruit, while rice and red Congo beans can be grown with little trouble. Many are too poor to buy much else in the way of food, and such a diet often produces under-nourishment, which is one reason why many suffer from chronic hookworm and malaria. The Department of Sanitation conducts clinics in the hill-country and gradually the peasants are gaining confidence in scientific methods, which are to them very new and mysterious.

Yet life in the little thatched huts is not miserable or doleful. For all their poverty and ignorance the peasants are self-respecting; they possess a certain dignity, and have the fortunate gift of laughter. Cock fighting is their great sport, and every man has his favorite birds. On Sunday excited crowds gather to watch one contest after another, and the crowing of the cocks echoes from hamlet to hamlet. A very popular amusement is the Congo dance, as primitive now as when it came from the African jungle. Every Saturday night the low, compelling throb of goatskin drums sounds throughout Haiti, with a subtle and irresistible potency. Innately graceful, the dancers abandon themselves to that weird music, and achieve a marvelous bodily rhythm.

Another African inheritance is the religious cult of Voodoo, which the peasants retain and mingle with their Christianity. The primitive Africans believed that gods and spirits inhabited animals and natural forces, or natural objects like stones and trees. One of the greatest spirits, Damballah, was incarnate in the green serpent, which was especially respected. Legba was god of the cross-roads, and there were many others. Spirits must not be angered—they must be placated—and so an elaborate ritual involving chants, prayers and sacrifices



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YOUNG HAITI'S SMILE

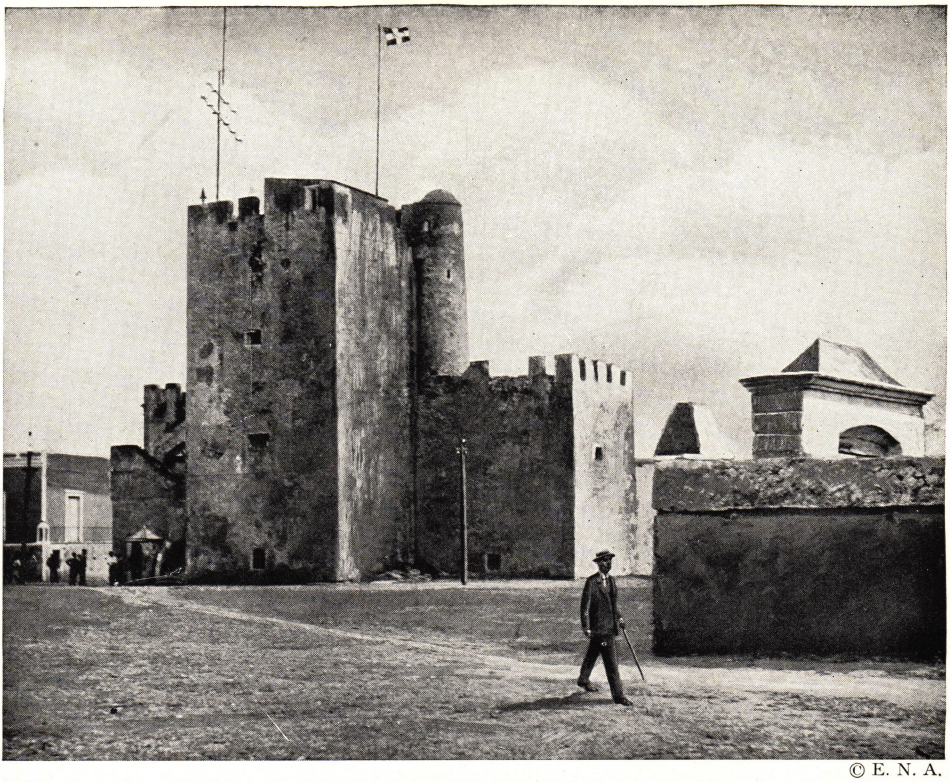
Children in Haiti lead a lazy, happy life, often not bothering with clothes until nearly half-grown. This youngster's disposition is as sunny as the country itself.

grew up in connection with the worship of Voodoo gods, who had their temples and their priests. The latter were called "papalois," and the priestesses were known as "mamalois." Sometimes these men and women increased their influence by means of sorcery, and sold the people charms of various kinds. But primarily Voodoo was, and is, a religion, not a black art. To-day in Haiti, Voodoo temples and rites are forbidden, and the use of the great Rada drum which summoned the worshipers is illegal. Yet the old beliefs linger on among the peasantry, and are but gradually superseded by modern ideas.

Santo Domingo never had so many slaves as Haiti, and under Spanish rule it was easy for a slave to buy his freedom. But in 1795, and again in 1822 when Haiti ruled the whole island, many of the white inhabitants emigrated to Cuba or Porto Rico; so most Dominicans to-day are mulatto, a combination of the Spanish and Negro races, with a strain of Indian blood. There are some pure-blooded Negroes and a few pure-blooded whites, including foreigners. Turkish and Syrian traders carry on much of the business in

THE OLD SPANISH STREETS OF SANTO DOMINGO HAVE SEEN MUCH HISTORY IN THE MAKING

Santo Domingo is the capital of the Dominican Republic, on the island of Haiti, and is the oldest existing settlement of white men in the New World. Columbus discovered the island—which he called Hispaniola—in 1492, and his brother Bartholomew founded the town four years later. It was long the most important Spanish city in the colonies, until the rich lands of México and Perú eclipsed it. The fine carved doorway on the right and the overhanging balconies with their beautiful iron railings are reminiscent of the Spanish civilization brought by the conquerors.



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FORTRESS BUILT AT SANTO DOMINGO IN THE TIME OF COLUMBUS

Inside the fort, La Fuerza, is this hoary tower, part of the old citadel built early in the sixteenth century. Legend has it that here Columbus was imprisoned by Bobadilla, governor of the colony, but at the time of the great admiral's imprisonment in 1500, the little settlement of Santo Domingo was established across the river from the present city.

the larger towns. For its size and fertility the Dominican Republic is sparsely populated. Occupying nearly two-thirds of the whole island, it yet has less than half as many people as Haiti. The language and the atmosphere of the country are Spanish. Dominican writers—especially the poets—have made notable contributions to Spanish-American literature. Its culture is far ahead of its political and material development.

Like Haiti, Santo Domingo has seen a long series of revolutions, presidents and dictators. Since 1795 it has been a French colony, a Spanish colony, a part of Haiti, an independent republic, again a Spanish colony, a republic, and finally a virtual protectorate of the United States. To-day it is once more a republic, but its custom house and national debts are still handled by an American official.

Such a troubled history explains why Santo Domingo has not developed its resources to a greater extent. Its future lies in its agricultural possibilities. There is no land in the West Indies with more fertile soil, richer vegetation or more favorable climate. Here the first sugar-cane in the West Indies was planted, and sugar is still the chief crop. Since, however, modern sugar plantations require a large amount of capital, most of them are now owned by foreigners. The best sugar lands are in the southern part of the republic, around San Pedro de Macoris.

Farther north, beyond the central mountain range which divides the country, cacao is the principal crop. Cacao, from which we get cocoa and chocolate, is a very good investment for small farmers. The trees require little attention and while they are growing to maturity other crops may be planted between the rows. Tobacco and coffee are also grown ex-

tensively in the northern provinces, and there are fine grazing grounds.

This northern district is a very beautiful part of the republic. It is diagonally crossed by the valley of the Cibao, extending from the Atlantic coast to the Bay of Samaná. The great bay forms the largest and finest harbor in the whole archipelago. It is thirty-five miles long and ten or fifteen miles wide, with a single narrow entrance channel. The buccaneers knew its shores well and fortified Trade Wind Cay, a little island near the entrance. Entrenched behind strong walls, and supplied with water from deep cisterns, they defied every authority in the West Indies. Samaná's commercial possibilities are enormous. At its upper end the railroad begins, and the lands along the shore are ideal for plantations of tropical fruit.

Historical interest centres in the city of Santo Domingo. To-day the capital of a tiny republic, it was once the centre of Spanish power in the New World. The great explorers—Balboa, Pizarro, Ojeda, Cortés, Ponce de León—came first to Santo Domingo before starting on their famous journeys of conquest. The Columbus family one and all were closely connected with the city. Bartholomew Columbus founded it in 1496, at the mouth of the Ozama River on the south coast. In 1502 a hurricane demolished the new little houses, which were rebuilt on the opposite bank. When Diego Columbus was governor he built a great palace where his lady entertained in splendor. To-day only the great walls survive.

The most ancient building in the city is the citadel within the fort of La Fuerza. This tower is the very oldest existing structure built by white men in the New World, having been finished by 1504. The Cathedral dates from 1514. The body of Columbus was brought here after his death in Spain, for he had wished to be buried in Santo Domingo, and some believe that it was not taken to Havana in 1795, but still rests in the island which he thought the loveliest of the West Indies.

Rollo H. Beck

ONE WAY TO ROLL YOUR OWN

Here a Dominican laborer is packing pipe tobacco for shipment to the factory. He has wrapped a palm leaf around the tobacco leaves and rolled them up, and now he is winding rope tightly around the roll to keep the leaves in place. Tobacco is an important crop in parts of Santo Domingo, and cigars and cigarettes are the chief articles manufactured.

Ewing Galloway

IN THE TROPICS ALMOST ANYTHING WILL DO FOR BUILDING MATERIAL

This hut in the backwoods of the Dominican Republic is built almost entirely of banana leaves. It looks as though a touch would knock it over, but the big leaves are tough in fibre and serve at least to keep out tropical downpours. These peasants are but little affected by the modern life of the capital and other cities.

HAITI AND SANTO DOMINGO: FACTS AND FIGURES

The island of Haiti is second largest in the West Indies, 400 miles long and from 24 to 165 wide; it lies between Cuba and Porto Rico, with the Bahamas north and the Caribbean south. The western part (about one-third) is occupied by the Republic of Haiti and the remainder by the Dominican Republic.

HAITI (République d'Haïti)

Area, 10,204; estimated population (1927), 2,300,200. A constitution of 1918 provides for a Congress composed of a Senate and a Chamber of Deputies elected by popular vote. Congress elects a president who holds office for a term of six years. Finances and the Garde d'Haiti (the gendarmerie force) are under the supervision of the United States according to the Haitian-American Treaty of 1915. Training of Haitian officers to replace the American in the Garde d'Haiti will probably be completed before 1936, the expiration of the treaty. Catholicism the dominant religion; most of the clergy are French. Elementary education free and nominally compulsory; 106,425 pupils enrolled in 1,188 schools, 1928-29.

Haiti is agricultural, growing coffee, cacao, sugar, tobacco, cotton; exports (1929), 62,956,000 pounds of coffee, also goatskins, sugar, cotton, cottonseed, logwood and extract, lignum-vitæ, cacao and honey. Chief imports: wheat flour and other foodstuffs, cotton goods, soap, petroleum products, iron and steel, machinery. There are 2 sugar mills, 1 logwood factory, 1 cottonseed oil plant. Railway mileage (1929), 158, privately-owned; 1,860 miles of telegraph and 5,968 of telephone wire (1929). Highway mileage (1928), 929. Chief towns: capital, Port-au-Prince, 79,797; Cap Haïtien, 20,000; Aux Cayes, 15,000; Gonaïves, 12,000; Jacmel, 10,000; St. Marc, 10,000.

DOMINICAN REPUBLIC (República Dominicana)

Estimated area, 19,332; population (1930), 1,200,000. Under the Constitution of 1929, the Congress consists of 2 houses elected for 4 years by direct popular vote; the President and 10 ministers make up the Cabinet; President ineligible for immediate re-election. The customs and the national debt are supervised by an American Receiver-General of Customs. Catholicism the state religion; other denominations tolerated. Education free and nominally compulsory; school attendance (1930) 90,366.

Agriculture most important and sugar the chief crop; 345,000 long tons produced in 1928-29. Raw sugar, cacao (47,007,000 lbs.), coffee, unmanufactured tobacco (36,297,000 lbs.) the principal exports. Forest products, lignum-vitæ and mahogany. 21 sugar mills. Railway mileage (1929), 149, besides 255 miles on large estates; highway mileage (1929), 845, and being extended; 617 miles of telegraph and 4,436 of telephone wire (1928). Chief towns: capital, Santo Domingo, 30,957; Santiago de los Caballeros, 17,052; San Pedro de Macoris, 13,802; Puerto Plata, 7,807.

British Guiana Govt.

INACCESSIBLE GRANDEUR OF THE GREAT KAIETEUR FALLS

Back in the jungle of British Guiana, five days from Georgetown, is this magnificent waterfall, where the Potaro River makes a sheer drop of seven hundred and forty-one feet. It is so difficult to reach that few white men have ever seen it. Ordinarily over one hundred feet wide, the falls swell at high water to a width nearly four times as great.

THE LANDS OF EL DORADO

Riches of Venezuela and the Three Guianas

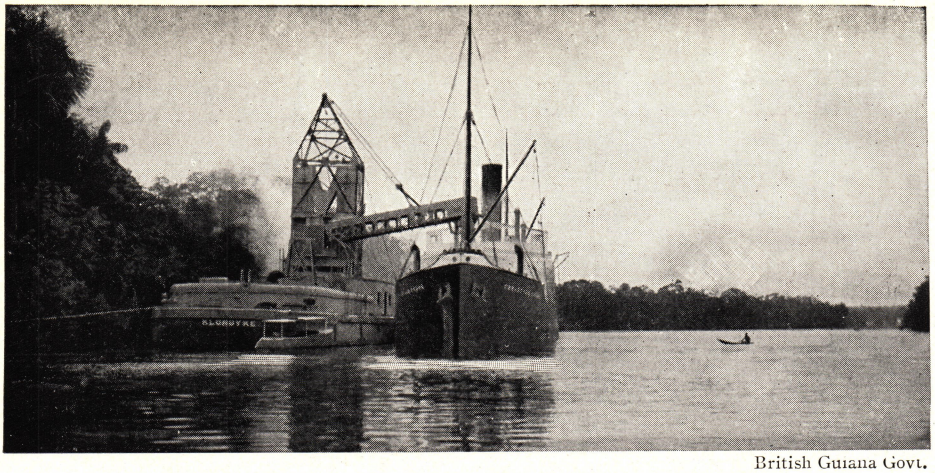
No part of the world is more fascinating than the great continent of South America. Stretching from the tropical Caribbean Sea almost to the Antarctic Ocean, rising from swamps below sea level to towering peaks 23,000 feet high, it boasts an unequaled variety of surface and climate. Originally peopled by many different Indian races, it was conquered and settled by Spain and Portugal in the sixteenth century. Three hundred years later the Latin-American colonies became independent, and now ten republics, large and small, occupy most of the vast territory. In this chapter we shall learn something of Venezuela, the northernmost republic, and of the three remaining European colonies, British, French and Dutch Guiana.

IN the days of long ago, when bold adventurers sailed out upon the seas to plunder Spanish galleons laden with treasure from South America, there were stories about a city with roofs of gold in the region east of the Orinoco River. These legends, implicitly believed by all Europe, fired the imaginations of men and sent them to search for this fabulous El Dorado, "the golden land," and its phantom city of Manoa. The seekers did not find the city of gold. They discovered instead a land of golden possibilities, which even to-day await the adventurous. The whole vast, mysterious country north of the equator and east of the Andes is after all so rich in timber, gold, diamonds, foodstuffs and oil that it is still regarded as a genuine El Dorado.

The great tropical region between the Orinoco and the Amazon is known as Guiana. Part of it belongs to Brazil and is described with that country; the rest is divided between Venezuela and the three colonies of British, French and Dutch Guiana. The "three Guianas" are the only European colonies left in South America. England, France and Holland fought with each other for control of the territory, and now each has a share. All three colonies are much alike in physical features. The seacoast is a belt of mud from eighteen to fifty miles wide, formed by many rivers and frequently flooded during the rainy season, so that dikes and drainage systems are necessary to protect the sugar plantations. From behind this alluvial plain the turbulent rivers pour down through a land covered for the most part with dense tropical forest. Snakes and alligators are dangerously plentiful; jaguars, armadillos, poisonous ants, scorpions and countless other insects inhabit the jungle; monkeys and parrots chatter in the high tree-tops. Gorgeous orchids and rich ferns fringe the tortuous streams, where beautiful rose-colored flamingoes make a vivid picture against the green growth of the banks.

As the land rises ever higher toward the mountains of the south, the forest gives place to "savannahs," rolling plains where the grasses sometimes stand man-high. This is ideal cattle country, with only one disadvantage—the difficulty of reaching it, for there are no railroads except along the coast. The rivers are the highways and they are so impeded by rapids and waterfalls that steamers cannot go very far inland. Only small boats such as the Indian dugout canoes can be used on the upper stretches. Still farther back from the coast, mountain ranges divide the Orinoco watershed from that of the Amazon, and this impenetrable jungle-covered wilderness has never been well explored. The highest peak is Mount Roraima, on the Venezuelan frontier, a great reddish cliff which rises straight up out of the green jungle.

In little forest clearings beside the rivers, or higher up on the wide savannahs, dwell the native Indians, leading lives as simple and uncivilized as those of their ancestors. They wear little clothing—pieces of cloth, feathers and bead ornaments suffice. The men are the hunters. The women cook, cultivate the



British Guiana Govt.

YOUR KITCHEN ALUMINUM MAY HAVE ORIGINATED HERE

Less spectacular than the gold found in some parts of Guiana, but very useful, is the mineral called bauxite; from it comes the aluminum which is nowadays indispensable in the households and factories of the world. Bauxite is mined in the wilderness of British Guiana, far up the Demerara River, where this steamer is loading.

cassava patch, and gather firewood. Cassava roots, from which we get tapioca, are grated and crushed to extract the poison they contain, and are then made into flat cakes, cooked on a griddle and eaten as bread.

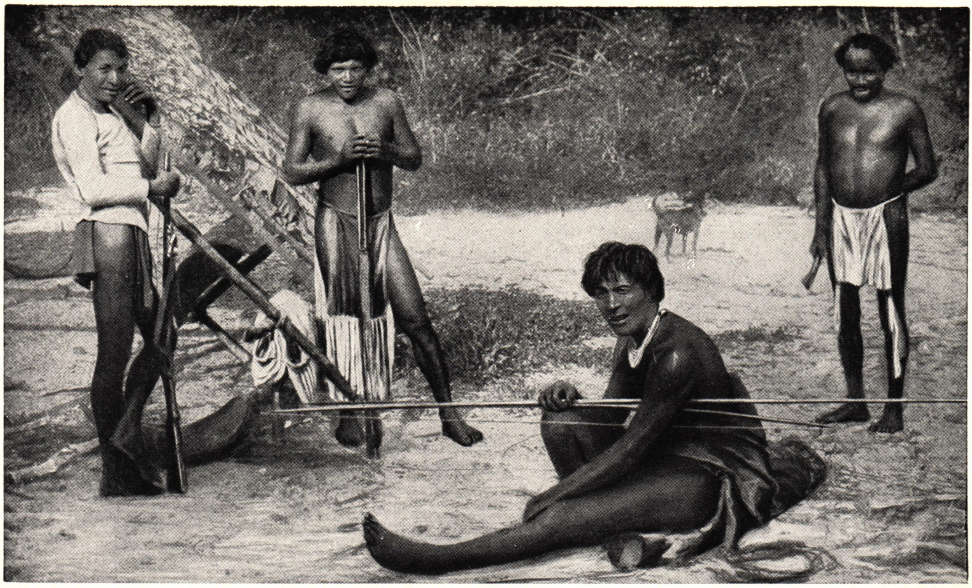
The population of the colonies is mixed. For instance, on the streets of Georgetown, the capital of British Guiana, we should meet a few white people, mainly English and Portuguese, and a host of colored folk. There are Negroes, descendants of the slaves who used to work the sugar plantations, slant-eyed Chinese, Syrians, slim laborers from far-distant India and Java, and perhaps one or two silent, copper-colored aborigines. Georgetown is at the mouth of the Demerara River, below sea level, and so is protected by a sea wall which serves as a promenade, while some of the streets have drainage trenches down the side or middle. Many of its wooden houses are built on piles as a precaution against floods.

Dutch Guiana used to be called Surinam, and its capital is named Paramaribo, which does not sound at all Dutch. In days gone by, Paramaribo was a disreputable port where slavers sold their miserable, crowded, human cargoes and drank up the money in rum. But today it is as neat, quaint and substantial—though not as prosperous—as one would expect a Dutch city to be. Canals criss-cross it, and trees line the wide straight streets.

Cayenne, the capital of French Guiana, is a sleepy hot town, quite lacking the spice of its peppery name. French Guiana has suffered from the home government's policy of maintaining penal settlements on the islands off the shore. The presence of the convicts has kept immigrants away, thus tending to hold the colony in a backward condition. Its plantations are less extensive than those in the other colonies.

Sugar, cotton, coffee, cacao, rice, corn, plantains, coconuts and bananas all flourish in the moist heat. The forests contain untold wealth in the form of valuable timber trees. There is also the balata tree, whose milky sap dries and forms a rubber-like substance used in making belting for machinery. Gold, the metal which led to the settlement of Guiana, is found in many places, but mining is expensive. During the search for gold, diamonds were discovered up the Mazaruni River in British Guiana. The stones are small, but fine, and the value of those found in 1926 was three and a half million dollars.

Across the border in Venezuela the great new source of wealth is oil. Venezuela is larger than all the Guianas com-



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NATIVE HUNTERS WHO ROAM THE FORESTS AND SAVANNAHS

Two of the men have modern rifles, but a third still relies on his bow and arrow to kill the jaguars, pumas, tapirs, sloths and monkeys which live in the dense forests and jungles of Guiana. The Indians make their own bows, arrows and blow-pipes. With the poisoned darts of the latter they bring down small game like birds and monkeys.

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CARIB WOMAN STANDING BEFORE HER UNWALLED HOME

All that the jungle Indians of Guiana want by way of a house is shelter from the rain and a place in which to sling the palm-fibre hammocks which they use as beds. Walls are unnecessary. This woman belongs to the Carib race, which formerly spread over half the West Indies. Other tribes are the Arawaks and the Warraws.

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COLORED CONVICTS DANCING IN A PENAL SETTLEMENT OF FRENCH GUIANA

For many years France has sent numbers of her most dangerous criminals to Devil's Island and Maroni, on the Guiana coast. These penal colonies have had a very bad reputation, because hundreds of convicts died from the unhealthy climate and poor living conditions. Escape is almost impossible, and if a man does get away he is confronted with all the dangers of the hot jungle, where it is difficult for anyone but an Indian or a bush Negro to survive without weapons and equipment. Few indeed reach freedom, although attempts are constantly made.

HEERENSTRAAT LOOKS LIKE THE MAIN STREET OF A COUNTRY TOWN

The wide streets of Paramaribo are surfaced with tiny sea shells, and the feet of passersby make a slight crunching noise as they go. The tall trees provide welcome shade in this hot town, which does not look as though it had ever witnessed anything half as exciting as the arrival of a slave ship. Yet it used to be an infamous slave port.

bined, large enough to contain oil lands, cattle country, gold country, timber forests and many kinds of farming land. The great Orinoco River divides it almost in two, forming a large valley right through the middle of the country from west to east. The river brings down so much silt and mud that through the ages it has built up a delta covering forty thousand square miles, across which the water now finds its way in many separate streams. South of it are tropical highlands similar to the Guiana mountains—forest-covered hills cut by rivers which reach back toward Brazil. North and west of the Orinoco are wide grassy plains similar to the savannahs of Guiana, but known in Venezuela as "llanos," where feed herds of cattle, antelope and peccaries (peccaries are wild animals resembling small pigs). The llanos do not extend clear to the Caribbean; between them and the sea rises a mountain wall which is the last low part of the mighty Andes range. To the westward rises the Cordillera de Mérida, looking high enough to suit our idea of what the Andes should be, and from that point on, Venezuela is mountainous. Only on the low, swampy shores of Lake Maracaibo is it evident once again that we are in the tropics. The lake water is fresh, though it connects with the Caribbean by a narrow inlet through which the Spaniard Alonzo de Ojeda sailed his little vessels in the year 1499. He saw the huts of the lake Indians built on stilts above the water, and was reminded of Venice, the city built upon the sea. So he called the place Venezuela—"Little Venice"—and the name was applied to the whole country.

The Spanish settlers were constantly forced to fight off buccaneers and privateers of many nationalities in the days when the Caribbean was the bloody rendezvous of all adventurers. Cumaná is the oldest Spanish settlement in South America. It was founded in 1523. All the old Venezuelan cities are along the coast. There are three main ports—Maracaibo, Puerto Cabello and La Guaira. Caracas, the capital, lies three thousand feet high in the coastal mountains, which make a background for its luxuriant gardens and red-roofed houses. Caracas is quite ancient, as cities in America go,

Ewing Galloway

RANGE UPON RANGE OF HILLS BEHIND THE RED ROOFS OF LA GUAIRA

La Guaira, called the hottest seaport on the Caribbean, is certainly one of the most colorful. The low houses are pink, blue, yellow—every color—and many of the roofs are red tile. La Guaira is the chief port of Venezuela, and loads of cacao and coffee come down from the interior for shipment. The concrete highway from here to Caracas twists and turns for twenty-three miles through the mountains, climbing three thousand feet. The distance from port to capital in an airline is only seven miles, and air service will some day be all-important.

but thanks to earthquakes and wars most of its buildings are less than a century old. Consequently its narrow straight streets have modern paving and lighting, and its automobiles, electric car lines and telephones do not seem new and incongruous alongside the fine public buildings. The low adobe walls of the dwelling-houses are painted in soft yet bright colors, and green shrubbery grows in every patio. There are beautiful parks and squares such as the Plaza de Bolívar, dedicated to the great hero of the war for independence.

Simón Bolívar was born in Caracas, and he did so much to overthrow Spanish rule in South America that he is called the Liberator. Bolívar was a man of great courage and forcefulness, with ambitious ideas for reorganizing the country. He defeated the royalists in Venezuela, Colombia and Ecuador, uniting those three states for a time. Then he marched south and routed the royalist armies in Perú and what is now Bolivia. His plans for making one great nation of Northwestern South America proved unpopular, and he died in exile, but his brilliant services to the cause of independence are fervently remembered by every Latin-American, and Venezuelans are very proud to be his countrymen.

At the time of his victories, Bolívar was all-powerful but after he was exiled and Venezuela became a separate republic (1830), no one seemed able to govern the country. Revolution followed revolution until 1870. Since then several dictators in turn have held control, the first of whom was President Guzmán Blanco. Another was Cipriano Castro, who did little but make trouble for his country. He was overthrown in 1908, and Juan Vicente Gómez took his place. Gómez has paid some attention to the development of the land. He is no longer president, but still holds more power than anyone else. Many people are discontented with his autocratic methods and wish to inaugurate a more truly popular government.

West of Caracas the country is given over to agriculture of many kinds. In the low valleys are sugar plantations, tobacco fields, groves of oranges and coconut

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STATUE OF THE LIBERATOR IN THE PLAZA DE BOLÍVAR

Nearly every large South American city has erected a statue in memory of Simón Bolívar, the great Venezuelan who did more for the independence of the Spanish colonies than almost any other one man. His tomb is in the National Pantheon here at Caracas. Across the Plaza we can see part of the Cathedral, built in colonial days.

palms. Higher up cacao and coffee supply the export trade, while corn and cotton are raised to help feed and clothe Venezuela's three million people. Farther west, around the proud old cities of Valencia and Barquisimeto, there are stock farms as well, which supply the packing-houses at Puerto Cabello.

Crossing the mountains to Lake Maracaibo, the character of the country changes completely. This fever-infested section of the tropics gives Venezuela its rank as the world's second largest producer of oil. The volume of petroleum obtained has increased astoundingly in the past few years. For example, in 1926 well over thirty-three million barrels were produced, and in 1927, sixty-four million; within two years production was more than doubled, thus creating millions of new wealth in a country which had had difficulty in meeting its obligations. What is more, so far as can be judged, production has not yet reached the maximum. The petroleum and asphalt deposits reappear in a different part of Venezuela. Lake Bermúdez, near Cumaná, is an asphalt lake much larger than the famous pitch lake of near-by Trinidad. It contains one thousand acres of the sticky stuff so much used in paving our streets and roads and roofing our buildings.

A very different product comes from Margarita Island, just off the coast at Cumaná. Divers there bring up many thousand dollars' worth of pearls annually. Other gems such as diamonds may be found in the wild country south of the Orinoco. This vast region is rich in gold and many other commodities, but it is difficult to reach. Lumbermen and miners must travel by water or over hazardous jungle trails. Ciudad Bolívar on the Orinoco is the base from which men start out to collect forest products. The rubber gatherers get supplies there in March and April, and set out for the jungle before the rainy season begins. At the end of the season they bring in not only rubber but balata and some chicle.

Back in the partly unexplored wilderness land bordering on Guiana and Brazil are many Indians, leading a primitive life like that of the Guiana tribes. But the real Venezuelan, the man of the llanos or

Ewing Galloway

BUSINESS GETS UNDER WAY IN THE CARACAS MARKET

Farmers from the hill-country roundabout pack up their produce on the saddles of their burros and journey into Caracas for the day. They bring fruits, vegetables, live fowls and cuts of fresh meat to supply the housewives of the capital. Here we see long strings of garlic piled on the ground, and a tray of big pineapples on the steps.

Ernest Peterffy

PIONEERING IN THE VENEZUELAN JUNGLE

The vast backwoods are rich in all sorts of forest products, but development is difficult. Getting in and out of the jungle means days and weeks of hard travel up dangerous rivers and over rough trails, in a climate where the thermometer reaches 112 degrees. Highways and railroads are not yet built, but air service now offers hope of quick communication.

the coast mountains, has both Indian and Spanish blood in his veins. Negroes were imported in colonial days to work the sugar plantations, and they have remained an important element in the population. There are a few old families which trace their descent exclusively from the Spanish conquerors, and make up the nucleus of the educated, cultured class of Caracas, Valencia and the other cities. From this group come lawyers, doctors, politicians, writers and scholars. Two universities—that of Los Andes at Mérida, and the Central University at Caracas—offer advanced studies of all kinds. The majority of Venezuelan children do not continue in school beyond the age of fourteen, which is the limit for compulsory attendance. Venezuela needs not only more schools but more people, and more energetic people at that. It will take many immigrants and much hard work to develop the rich and varied territory, to release the national wealth which facilitates not only economic improvement but intellectual development as well.

THE UNITED STATES OF VENEZUELA

VENEZUELA AND THE GUIANAS: FACTS AND FIGURES

VENEZUELA (Estados Unidos de Venezuela)

Bounded north by the Caribbean, west and south by Colombia, south by Brazil, east by British Guiana. Area, 393,967; population, 3,026,878. Congress of 2 houses; members elected for 3 years; President and Commander-in-Chief of army elected for 7 years. State religion, Catholicism; others tolerated. Education free and compulsory in theory; 105,932 pupils in all schools, 1927; 2 universities.

Crops: coffee, cacao, sugar, cotton, tobacco, corn, beans. Livestock estimated at 5,637,000. Forest products: balata, divi-divi, medicinal plants, hardwoods. Minerals: second in petroleum production, 137,675,000 barrels, 1930; asphalt, gold, copper, iron. Exports: petroleum, coffee, cacao, hides, skins, furs, sugar, balata, cattle, asphalt, pearls, divi-divi. Imports: iron and steel manufactures, machinery, cotton cloth, foodstuffs. Railway mileage (1927), 661; highways, about 4,064; waterways, about 11,160. Chief towns: capital, Caracas, 135,253; Maracaibo, 74,767; Valencia, 36,804.

BRITISH GUIANA (British Colony)

Bounded north by the Atlantic, west by Venezuela and Brazil, south by Brazil, east by Dutch Guiana. Area, 89,480; population (1927), 308,473; East Indians, 41%. Capital, Georgetown, 57,416. Administration: Governor, Executive Council, Legislative Council. Products: sugar, rice, coconuts, coffee, cacao, rubber, gold, diamonds, bauxite, charcoal, timber.

DUTCH GUIANA (Surinam, Dutch Colony)

Bounded north by the Atlantic, west by British Guiana, south by Brazil, east by French Guiana. Area, 54,291; population (1927), 145,763. Capital, Paramaribo, 45,791. Administration: Governor, advisory council, elected representative body (the Colonial States). Products: sugar, cacao, coffee, rice bananas, rum, molasses, gold, balata.

FRENCH GUIANA (French Colony)

Bounded north by the Atlantic, west by Dutch Guiana, south and east by Brazil. Area about 34,740; population (1926), 47,341 excluding troops, officials and Indians. Capital, Cayenne, 13,936. Administration: Governor, Privy Council, elected Council-General; represented at Paris. Products: gold, rice, cacao, sugar, indigo, gutta-percha, timber, balata, hides.

IN THE ANDES

Two Countries of the Mighty Mountain Range

If one enters the great continent of South America by way of Colombia it does not seem very different from the Caribbean lands along the way. But in Colombia different climates meet; the heat of the low tropical shoreline gives way to the cold of the high Andes. The farther south along the Pacific one goes, the more mountainous the coast becomes, and Ecuador, which is next to Colombia, seems to be nothing but mountains, with scenery past description. Both Ecuador and Colombia have fine old capitals built thousands of feet high in the hills, where Indian cities flourished before the Spaniards came, and both are rich in the products of lowland as well as highland.

WHEN the Spanish explorers of Colombia set out early in the sixteenth century from their settlements on the Caribbean Sea to search for gold, they found that, in addition to swamps, forests and dangerous rivers, they were confronted by lofty mountains into which their Indian enemies always vanished. When the adventurers followed into the mountain fastnesses, they found that there was always another mountain beyond. Had they continued to march on for years they would still have found "another mountain beyond," for they were on the Andes, that mighty mountain system which runs for five thousand miles along the whole western margin of South America.

Beginning at Cape Horn in the south with a single moderately high range, the Andes grow higher and wider as they stretch northward; in fact, they consist for a great part of their length of two and three parallel ranges, or Cordilleras, separated by river valleys. It is among these snowy giants that the Amazon and a host of lesser rivers have their beginnings. This magnificent mass of mountains contains the highest volcanoes and some of the highest peaks in the world. Within its limits can be found an infinite variety of climate and scenery. There are high plateaus, some of which are very fertile, while above are mountain slopes where the grass barely suffices for scattered flocks of sheep. One can mount even higher, till no living thing is seen but the great condor, that majestic bird of the lonely heights where vegetation ceases, and the great peaks, even at the equator, are wrapped in eternal snow.

The Colombian Andes consist of three Cordilleras parallel to the coast—the Eastern, Central and Western. Between the last two is the beautiful valley of the Cauca River; between the first two, through almost the entire length of the country, the River Magdalena flows north to the Caribbean Sea. In spite of shoals and swift current, this waterway is the main route into the interior.

East of the mountains, grass-covered plains—the llanos—stretch away toward Venezuela and the Orinoco River, and large rivers flow down through unexplored jungle country to join the mighty Amazon. On the vast llanos there are two seasons, one wet and one dry; the Amazon basin has torrents of rain most of the time and always it is hot—often over 100°. The coastal plains, on each side of the Isthmus of Panamá, are low and hot. Colombia is lucky to have territory on both the Caribbean and the Pacific.

From Barranquilla on the Caribbean one may fly to Bogotá, the capital, in seven hours; but by making the long journey up the Magdalena River by steamer one will realize more forcibly the contrast between the coast and the interior of Colombia. The shallow, muddy river is full of alligators, and lined with mosquito-infested jungle or plantations of bananas and sugar-cane. At Girardot the railroad begins its difficult climb over the mountains; by the end of the trip the temperature is 55° instead of 90°,

J. E. Bellows

FUEL STACKED ON THE BANKS OF THE MAGDALENA RIVER, COLOMBIA'S GREAT WATERWAY

The wood-burning river boats which navigate the treacherous Magdalena are flat-bottomed stern-wheelers much like those in use on the Mississippi. It takes seven or eight days by steamer and train to go from Barranquilla to Bogotá, but planes can make the trip in as many hours. Air service has stimulated trade all through mountainous Colombia, where railway construction is so difficult. The climate of the Magdalena Valley is tropical, as the palm trees indicate. Sugar and bananas come from this district, which also contains valuable oil fields.

J. E. Bellows

CARTAGENA, ANCIENT SPANISH STRONGHOLD ON THE BLUE CARIBBEAN

Cartagena was founded in 1533, before the interior of Colombia had been explored. Some of the old fortifications are forty feet thick, yet the rich city was three times sacked by pirates. To-day Cartagena is second only to Barranquilla as a port. It is hot and sunny, but colorful, with narrow streets separating low houses painted in blue, vermilion or green.

and snow-capped peaks are everywhere visible, for Bogotá is eighty-six hundred feet high in the Eastern Cordillera. Instead of white cotton suits, the workingmen of the plateau wear dark trousers and a warm wool ruana, which is a square blanket slit in the middle to go over the head. Men and women alike wear "Panamá" hats, and rope sandals called alpargatas. Surrounded by highly cultivated land and having a healthy climate, Bogotá is, as befits a capital, the heart of the intellectual life of the country. In spite of trolley cars, electric lights, telephones and other luxuries of modern life, there is about this charming city a certain air of aristocratic aloofness suitable to a place where many of the inhabitants boast ancestors of the best Spanish blood.

Jiménez de Quesada conquered the interior of Colombia about 1536. In those days it was called New Granada. Upon gaining independence from Spain in 1819, with Bolívar's help, the country was for a time joined to Ecuador and Venezuela, but that arrangement did not last and Colombia, after many stormy years, adopted its present name and constitution. In 1903 the valuable Isthmus of Panamá was lost through revolution, but of recent years there have been no political upheavals.

Most of the white people live in the cool mountain country, but down on the hot coast one sees many Negroes. In addition to different tribes of Indians, there is a large proportion of mestizos, and of cholos, the descendants of mestizos and Indians. These folk lead simple rustic lives, very far removed from the rush of industrial countries; a horse or a boat is their ordinary means of locomotion, for automobiles are largely useless, railroads non-existent, and air travel expensive. The Chibcha Indians of the high plateaus have kept their ancient civilization to some extent, while adopting features of Spanish and modern American life. But isolated and primitive tribes refuse to give up their age-old customs, and on the lower slopes of the Eastern Cordilleras dwell the Motilones and the Guahibos, who have the reputation of greeting inquisitive strangers with poisoned arrows. Their numbers dwindle year by year, and this is true also of the picturesque Indians of the Goajira Peninsula, the northernmost bit of South America.

To-day in Colombia one is even less conscious of the past than of the future, for the country is just beginning to develop its amazing possibilities. Almost all the rivers contain gold, and platinum is frequently found. Coal and other minerals await the miner, while oil is now gushing from newly drilled wells at the rate of fifty-two thousand barrels a day.

The finest emeralds in the world come from the Muzo mines north of Bogotá. There in the crater of an extinct volcano Indian laborers cut out chunk after chunk of the quartz containing the gems, and other workers carefully break it, washing and searching the fragments so that not one small green crystal is overlooked.

The soil of the valleys and plateaus is very fertile, and a tropical country of such varying altitudes has a bewildering variety of climates, each with a different agricultural product. One may travel from the tropics to the arctic zone simply by climbing a mountain. Bananas and sugar-cane grow along the coast and millions of bananas are shipped from Santa Marta to the North American markets. Cacao grows farther up the Magdalena, and when one gets high enough above the sea one notices everywhere the glossy leaves of the coffee trees. Most of the merchandise sent down over the hill trails on muleback and in ox-cart is coffee—sack after sack of it. It is a good product for a mountain land because, weighing little, it is easily transported. Colombian coffee is famous for its excellent mild flavor.

Colombia grows not only the customary plants of the tropics—beans, sugar-cane, mangoes, bananas, melons, cassava, plantains, pineapples, papayas, oranges, limes—but foodstuffs of the temperate zone, such as potatoes, wheat and peaches. In addition it boasts fruit and vegetables peculiar to itself. Balú beans come in pods two feet long and grow not on vines but on trees. Arracachas are lumpy-looking root vegetables which taste a bit like parsnips, only better. On the sabana (or plateau) near Bogotá grow blackberries as big as plums. The Cauca River Valley is a veritable garden spot; lying three thousand feet above the sea, and walled in by mountains, it has a climate little short of heavenly. Farther down the Cauca is Antioquía, where flowers and neat farms surround cotton mills and gold

SPAIN HAS LEFT HER MARK UPON HER FORMER COLONIES

The old stone fountain in the plaza at Cundinamarca dates from the days of Spanish rule in Colombia, and the long low convent adjoining the little church is likewise part of the civilization brought from Spain. But the woman filling her water-jar from the fountain by means of a long tube is an Indian, whose people lived here before the Spaniards came.

mines, all symbolic of mountainous Colombia's well-nigh inexhaustible possibilities.

As we go down the coast to the neighboring republic of Ecuador, the Andes rise still higher. They have been compared to a ladder, with parallel mountain ranges forming the two sides. The rungs of the ladder are the transverse ridges which cut up the intervening land into high plateaus known as "páramos." Ecuador is a small country but its scenery is on a grand scale. There are thirty-eight volcanoes with an altitude of more than ten thousand feet, and at least ten of these are active. Mount Sangay has a perfectly shaped cone of white snow from which rises a constant cloud of steam. The highest active volcano in the world is Cotopaxi, which measures well over nineteen thousand feet, while the beautiful snowy mass of Chimborazo, now extinct, is taller by yet another thousand. Ecuador is often called the roof of the world, and after one has traveled up over the hills from the Pacific, one feels that the name is decidedly appropriate.

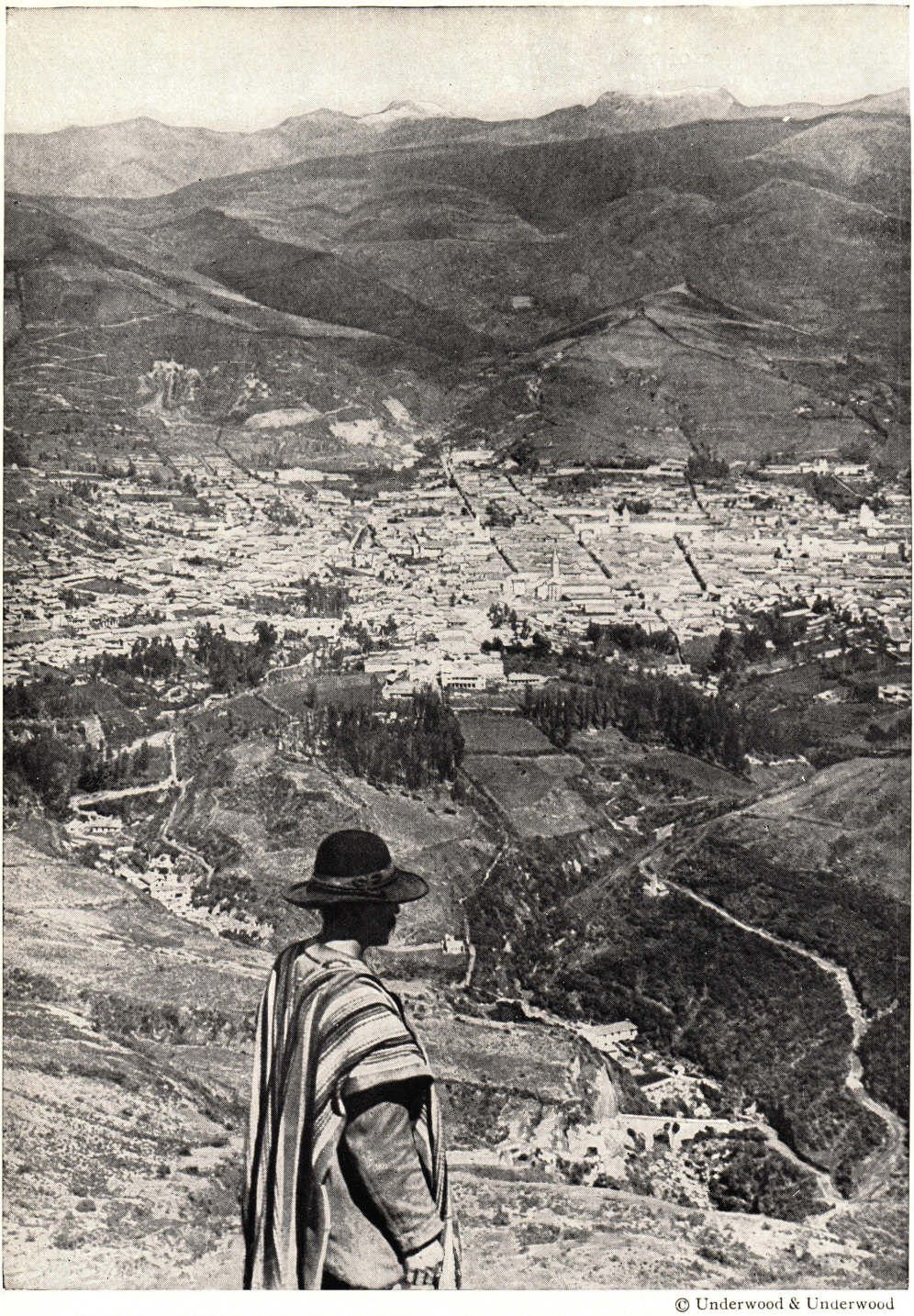
Colombian Consul-General

PATIO OF THE POST OFFICE AT BOGOTÁ

This beautiful old building, formerly a monastery, is a vivid reminder of Colombia's colonial days. Bogotá was a centre of Spanish culture when North America was still a wilderness, and its citizens are proud of its traditions.

Quito, the capital, lies a thousand feet higher up than Bogotá. Towering above it is Pichincha, the "Boiling Mountain," a volcano which in 1575 covered the city with stones and ashes to a depth of three feet. Quito was already old when the Spaniards took it from the Incas, and the Incas had taken it from a still older people. One mountain in Ecuador, Llanganati, is traditionally supposed to hide vast Inca treasures somewhere in its recesses. The story goes that when Atahualpa, the last ruler of the Incas, was executed by the Spaniards, scores of Indians were hurrying along all the roads leading to Peru, with vessels of gold for the ransom of their king. As soon as his cruel death became known, the word was passed back—"Away from the road"—and the Indians and the gold vanished. Many unsuccessful efforts have been made to locate this hidden treasure.

The peasant people of the Ecuadorian highlands are Cara Indians, either pure or slightly tinged with Spanish blood. One meets them everywhere, the men in bright striped ponchos, or blanket-wraps, the women in thick red or blue shawls which serve to carry babies and burdens. A quiet, hardy people, they cultivate the soil, make baskets and ropes, spin the wool of their flocks and weave it into thick cloth, as their ancestors did centuries ago. They speak their own language even when



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QUITO, ECUADOR'S BEAUTIFUL CAPITAL IN THE HIGH ANDES

Although Quito is almost on the Equator, it stands 9,350 feet above sea level, amid snow-capped peaks, so that its climate is cool and healthy all the year. Seen from the volcanic slopes and alpine meadows that surround it, the city is a beautiful sight, with its white, red-roofed buildings gleaming in the sunlight against a background of blue and violet mountains.

McKay

HARDY AND SURE-FOOTED BEASTS OF BURDEN IN QUITO

Llamas are the only beasts of burden native to South America. They are valuable in the Andes for transporting loads over rough mountain trails. Llama pack trains compete with the railroads, for the queer looking creatures can travel on little food and water for nearly a week, and their woolly fleece protects them from the cold storms of the heights.

they know Spanish, and having refused to accept many European customs, are probably less civilized to-day than they were when Pizarro conquered their Inca rulers in 1533. The leaders of the ancient civilization disappeared during the wars of conquest, and the masses who survived became slaves of the white invaders. Even after Ecuador secured its independence in 1830, frequent political revolutions did nothing for the Indians and peonage kept them in debt slavery until 1918. In addition many were further handicapped by the prevalence of hookworm, but now with a progressive government enforcing compulsory education and carrying on a vigorous fight against disease, the Indians have a chance for better things.

Being so mountainous and yet right on the equator, from which it takes its name, Ecuador boasts resources only less varied and extensive than Colombia's. From the seacoast and the valley of the Guayas River come all the usual tropical products and some which are not so common. Kapok is a fibrous material obtained from the silk-cotton tree, and used in textiles, or to stuff mattresses. Vegetable ivory grows only in Colombia, Ecuador and parts of Perú; it is the nut of the tagua palm, and when ripe is as hard and white as elephant ivory. Another curious product, balsa wood, weighs less than cork and is valuable as insulating material, for it will not transmit heat. Alligator skins from the Guayas River sometimes appear on the streets of New York and Paris in the form of shoes and handbags.

But the two things for which Ecuador is most famous are cacao and Panamá hats. The tall evergreen cacao trees grow wild in the Guayas Valley, and are also cultivated in great plantations. This valley used to supply the world with one-third of all its cocoa; then a blight attacked the trees and seriously crippled the industry. Planters are now trying to grow cotton and sugar-cane instead. One of the most important national industries is the manufacture of the so-called Panamá hats, which are made almost exclusively in Ecuador. They are woven of very fine, flexible straw, and a good Panamá is worth many dollars.

In the rainy season the fertile Guayas Valley is flooded, and people go from village to village, from house to house even,

Dr. G. Sheppard

CARPET OF "PANAMÁ" HATS SPREAD TO BLEACH IN A VILLAGE STREET UNDER THE EQUATORIAL SUN

Many people do not realize that Panamá hats are never made in Panamá. They are so called in northern countries because travelers first became acquainted with them at Panamá City, where they were on sale. As a matter of fact, they are made only in Ecuador and part of Colombia and Perú. A certain variety of palm supplies the toquilla fibre from which they are woven, and the weaving is a fine art handed down among the Indians. The straw must be kept moist while it is being worked. A fine Panamá can be folded up and put in one's pocket without injury.

E. L. Andrade

COLORFUL RELIGIOUS PROCESSION IN ECUADOR

A majority of the Indians in Latin-America are firm adherents of the Catholic faith, to which they were converted at the time of the Conquest. In Ecuador the Church is especially well supported, and processions are common on feast days. The gaily dressed saints and the bright scarves of the marchers make splashes of color against the buildings.

by boat. Houses, of course, have to be on stilts. Guayaquil is the great seaport near the mouth of the river. It is larger than Quito, for all commerce of any importance passes through it. It used to be infected with terrible diseases—yellow fever, and bubonic plague—but strenuous measures have proved that a clean city is usually a healthful city, and nowadays ships are not afraid to put into Guayaquil.

The snowy mountains which rise so abruptly from the tropical coast are potentially quite rich, for Ecuador has gold, platinum and coal which have not been extensively worked. Beyond the Andes the Amazon jungle begins. Perú, Colombia and Ecuador all claim overlapping parts of this largely unexplored territory where savage tribes are the only inhabitants, so it is impossible to draw the map of Ecuador accurately. One unusual bit of territory is definitely hers, however. That is the group of Galápagos Islands out in the Pacific. The name is Spanish for the tortoises which breed there, huge creatures weighing sometimes six hundred pounds, the largest of their kind in the world. Other rare species of birds, lizards and plants are found on the islands, which are a paradise for the naturalist; types of plant and animal life which have long since disappeared from other parts of the earth have survived here, partly because the group is so completely isolated. But the giant tortoises are now in danger of extinction, as they are killed for their oil. The Galápagos lie almost directly upon the equator.

American Museum of Natural History

JIVARO HUNTER OF EASTERN ECUADOR TAKES A SHOT AT GROUND GAME WITH HIS BLOWPIPE

The Jivaro Indians are an active, intelligent people and clever hunters, depending for their food mainly upon game they kill. They are skillful with the blowpipe, using poisoned darts as missiles for larger creatures like peccaries, and balls of sun-baked clay for birds and squirrels. Jivaros have an unpleasant reputation for head-hunting, because they cut off and preserve as trophies the heads of their enemies. A Jivaro who has just killed an enemy eats only vegetables believing that if he eats meat the friends of the dead man will easily kill the slayer.

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HIGH-ARCHED BRIDGE ACROSS A SHRUNKEN STREAM AT BOGOTÁ

Bogotá is situated on a lofty plateau hemmed in by high peaks of the Colombian Andes. The air of the plateau—or sabana, to use the Spanish name—is pleasantly cool and very clear. There are four seasons, two wet and two dry. Bogotá is criss-crossed by cold mountain streams, and high bridges are necessary when the rains come.

COLOMBIA AND ECUADOR: FACTS AND FIGURES

COLOMBIA (República de Colombia)

Bounded north by Venezuela and the Caribbean, west by Panamá and the Pacific, south by Ecuador and Perú, east by Brazil and Venezuela. Estimated area, 463,785; estimated population (1930), 7,992,990. Congress of 2 houses; Senate elected indirectly and House of Representatives directly; president elected directly and not eligible for immediate re-election. Catholicism dominant, but other religions tolerated. Education free but not compulsory; 435,385 pupils in 7,531 schools of all kinds (1928); 5 universities.

World's second largest producer of coffee: 417,996,000 pounds produced, 1929. Other crops: bananas exported (11,200,000 stems), cacao, wheat, sugar, rice, cotton, corn, potatoes, beans, tobacco. Livestock estimated at 10,590,000. Petroleum production (1930), 20,345,916 barrels; gold (1928), 40,323 ounces; platinum, 46,410 ounces; silver, emeralds, salt. Exports: coffee, petroleum, bananas, platinum, hides, gold, straw hats, ivory nuts, tobacco, emeralds. Imports: cotton goods, iron and steel, foodstuffs, woolen goods, automobiles, paper products. Railway mileage (1928), 1,740; highway mileage, about 2,340; waterways, about 1,115; air service between Barranquilla, Bogotá, Buenaventura and other points. Chief towns: capital, Bogotá, 235,421; Medellín, 120,044; Barranquilla, 139,974; Cali, 122,874; Cartagena, 92,494; Manizales, 81,091.

ECUADOR (República del Ecuador)

Bounded north by Colombia, west by the Pacific, south and east by Perú. Boundaries not settled; estimated area from 109,978 to 270,000; population, 1,500,000 to 2,000,000—10% white, 38% Indian, 41% mestizo, 11% Negroes and others. President and Congress of 2 houses elected directly by literate adults. No state religion, but Catholicism dominant. Education free and compulsory; about 100,000 pupils in 1,500 schools; 3 universities.

Cacao, the staple crop, has fallen off sharply since 1920; 33,974,000 pounds, 1929. Other crops: coffee, rice, cotton, sugar, fruits, grains, beans, vegetables. Livestock, 2,215,000 head. Forest products: ivory nuts, rubber, kapok. Minerals: 66,364 ounces of gold, 1929; 1,351,000 barrels of petroleum, 1929. Chief manufactures: Panamá hats, and cotton textiles. Exports: cacao, coffee, Panamá hats, ivory nuts, rubber, cyanide precipitates, fruits, hides, kapok, cotton, rice. Imports: textiles, foodstuffs, iron and steel, machinery, petroleum products. Railway mileage (1929), 639; telegraph wire mileage (1930), 3,680; telephone wire, 5,774. Chief towns: capital Quito, 80,702; Guayaquil, 100,000; Cuenca, 30,000.

BOLIVIA'S LARGEST CITY, LA PAZ, SET IN A DEEP VALLEY BORDERED ON ONE SIDE BY TOWERING PEAKS

Looking down on La Paz—itself 11,800 feet above sea level—from the rim of the plateau that half encloses it, the city looks as if it were built in a bowl. In the background is the immense snow-capped peak of Illimani. Some of its streets are so steep as to make wheeled traffic difficult. It is a beautiful city, boasting fine avenues and squares and many noble churches. The air is cool and invigorating and when the unheated houses seem chilly, one may prefer to seek warmth in the strong sunshine.

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THE LAND OF THE INCAS

Historic Highlands of Bolivia and Perú

There are few chapters in the story of mankind more fascinating than that of the rise of the Incas in the high mountain valleys of the Andes. How, during the Middle Ages of Europe, the Indians of these wind-swept highlands built up their wonderfully organized empire is still a mystery, for they had no system of writing. The Spanish conquest destroyed their civilization, but certain Indian customs and the ruins of many great cities survive as reminders of it. The mighty peaks of the Andes, in their ever-changing colors, have a grandeur all their own, and the mineral wealth in these rocky hills and the fertility of the tropical valleys give promise of a future as flourishing as the remarkable and romantic past.

ONE of the most romantic conquests in the world's history is that of Perú by the Spaniards. Francisco Pizarro, the "Conquistador," following the example of Cortés in Mexico, flung himself with a small following of soldiers upon the great empire of the Incas and became its master. This amazing exploit took place in 1532, in a century when every fresh discovery in the New World was stirring men's minds and impelling them to the most adventurous expeditions. Daring as was that overthrow of a mighty and well-organized kingdom, the rise of the Incas themselves was no less impressive. Their empire was not many centuries old. It, too, had been won by force of arms, as the invaders mastered and adopted a civilization higher than their own. There had been many centres of culture in Western South America, but of them we know very little. All that now bears witness to their existence is the ruins of wonderful cities constructed with exceptional skill in architecture and mechanics, and fine pottery wrought with no little artistic ability.

But who were the Inca rulers, the empire-makers of the New World? From what quarter did they come? History can tell us only that these warlike people were in control of a large tribe known as Quichua Indians living in the high plateau country of the Andes, while a kindred race, the Aymarás, settled in the great high valley of Lake Titicaca. Marching, it is thought, from the southwest, the Incas subdued one state after another and laid the foundations of their vast empire. By the sixteenth century they governed what are now Ecuador, Perú, Bolivia, part of Chile and northern Argentina, and had succeeded in developing a civilization which ranks among the highest achievements of the American Indian race. Above all, they had a genius for organization and their political and social system was remarkably effective. In addition they were engineers who could tunnel the solid rock, fling bridges across great gorges and build enduring roads; they were skillful farmers, and builders whose masonry is still a matter for wonder and admiration. The remnants of the fortress-city of Machu Picchu, perched high up on a rocky mountain-spur above the canyon of the Urubamba River, include stone terraces and extensive ruins of granite temples, palaces and houses. The golden Temple of the Sun at Cuzco, the capital, had massive walls covered with thin plates of gold; its water-pipes were of silver and in the gardens were to be seen animals and insects modeled in gold and silver. The Inca who occupied the throne was both king and god to his people. His person was sacred, for he represented the sun. And just as its rays penetrated every corner, so did his influence extend to every man and woman in the kingdom.

Since the Inca government collapsed, their land has seen centuries of oppression, warfare and struggles for independence. Bolívar, General San Martín and General Sucre freed the region from Spanish rule in the years between 1820 and 1825. Bolivia then separated from

A GOD OF HIS FOREFATHERS

The stone is an idol more ancient than the Incas; the man is an Aymará. The resemblance between the two faces shows that the blood of the old sculptors persists.

Perú and named itself for the Liberator, in recognition of his great deeds. Both nations have been republics ever since.

The seacoast of Perú is a desert of rock and sand, because no rain clouds from the Atlantic can cross the high Andean summits, while the cold waters of the Humboldt Current sweeping up from the Antarctic make the winter climate foggy and dismal—and "winter" in this latitude means the time from June to August. Yet Perú lies entirely within the tropics, and wherever there is water along the otherwise barren coast, there the soil yields rich returns. Each river valley, every irrigated section, is green with fields of sugar-cane, corn or cotton; there are vineyards and orchards, and groves of fruit trees.

Below the plateau surfaces of the Andes are gorges carved by the swift-flowing rivers. The bleak mountain tablelands, twelve and fourteen thousand feet above the sea, are girt in by rugged peaks of blue, red, black and dull brown rock, and swept by bitter winds from glaciers and snowfields. Trees are almost as rare in central Perú as in Shetland or Iceland; there is nothing but "ichu" grass and scanty herbage for flocks of llamas and sheep, while the Indian farmer reaps a small harvest of millet, barley and potatoes. But down in the river valleys, carefully terraced fields repay the labor of cultivation with tropical luxuriance. So we see that climate in Perú is a matter of ups and downs.

The Indians of the mountain plateaus are mostly Quichuas. Brownish in color, with straight black hair, they are a lean hardy people, but are addicted to drinking much "chicha," a liquor fermented from corn, and have a habit of chewing the coca leaf, from which the drug cocaine is obtained. It eases the suffering caused by the intense cold, but dulls the brain as well. As in Ecuador, their typical garment is the strikingly colored poncho, worn over short warm trousers. For headgear they use close-fitting woolen caps, topped off by large felt hats with the brims upturned in front. A favorite is the "pancake" straw hat, covered on one side with coarse woolen material and on the other with gaudy tinsel and velveteen. An old custom that survives to this day is the wearing of tassels and fringes on the headdress. The first Inca ruler, it is said, decreed that such distinguishing marks should be borne throughout the empire, and the different colors

used enabled his officials to know at once to which district any Indian belonged.

Cuzco, centre of the ancient kingdom, is a strange mixture of past and present. Features of modern life such as electric lights, telephones and moving picture houses contrast with the ancient stone buildings erected by the Incas and adapted by the Spaniards. Although there has been a constant fusion of the Indian and Spanish races, a large proportion of the population is pure Indian. Every day hundreds come in from outlying villages driving llamas laden with sacks of potatoes and barley for the great market, where the women sit against the walls with tiny piles of merchandise on the stones in front of them. Shops are arranged according to the goods they sell; hatters, saddlers, rope-makers, potters, all congregate in their respective quarters. Here, again, in the variety of wares one sees the strange contrast of old and new, for side by side with articles of native manufacture are cheap imported goods from the factories of Europe and the United States.

The present capital of Perú is Lima, "the City of the Kings," founded by Pizarro in 1535. From his day to the end of Spanish rule its name stood for wealth and power. In Perú the Spaniards really found the fabulous riches they sought in the New World; Inca strongholds yielded treasure greater than that of any mythical El Dorado, then the silver of Potosí and Cerro de Pasco continued to provide cargo for the annual treasure fleet to Spain. Down from the mines of the rugged Sierra came long pack trains of mules and llamas, bringing the precious metals into Lima and its seaport, Callao. From there the galleons sailed up the coast to Panamá, and the bullion was well started on its long journey to Spain.

British Museum

PORTRAIT POTTERY OF NORTH PERÚ

He must have been a humorous fellow, the potter who fashioned this water-jar in the form of a winking bogeyman. He did his work at Trujillo in Perú, centuries before the Incas came.

In Lima resided the viceroy and the archbishop, rivaling each other in magnificence. Many a fine church and palace gave material witness to the wealth of Perú's aristocracy, until the terrible earthquake of 1746 shook that splendor to pieces and an accompanying tidal wave literally drowned Callao. Yet Lima to-day seems still the city which Pizarro built; here still lives many a family tracing descent from one or another of his followers, and the spirit of Spanish days remains. The houses are built around patios and their low walls line the narrow streets, with beautifully

Dyott

PACK-MULES AND THEIR MASTERS RESTING IN AN ANDEAN VILLAGE HIGH AMONG THE CLOUDS

Central Perú is known as the "Sierra," which is the Spanish word meaning a mountain ridge, but originally used to describe a saw. At a distance, the Andean summits do indeed suggest the jagged teeth of some fabulous saw. Transportation in the Sierra is very difficult; the railways link only a few of the more important towns and mines, so that sure-footed beasts of burden are vitally important for carrying loads over rough trails only a few feet wide, where in places a misstep may mean death on the cruel rocks in some swirling river thousands of feet below.

carved wooden balconies projecting from second-story windows.

But Lima is more than an ancient city with an Old-World air. It is old, to be sure, but it is also the capital of a modern state undergoing renewed development. The government encourages reclamation of the desert coast by means of irrigation, and is directing the greatest project of all, which is to change the course of the Huancabamba River and carry it through a tunnel under the Andes, so that instead of emptying into the Marañon it will water thousands of acres as it flows out over the desert to the Pacific.

To reach the mining country, one must travel up into the heart of the mountains. The famous mines of Cerro de Pasco are connected with Lima and Callao by an equally famous railroad. That is the Central Railway of Perú, the highest standard-gauge road in the world. Cerro de Pasco has extraordinarily rich deposits of copper, which is mined by the most up-to-date processes, and the modern machinery makes the mining town seem very old and quaint. Its adobe houses are painted in bright colors and they seem to crowd each other for room on the crooked cobbled streets. It is a busy community, filled with thousands of Indian and cholo laborers—each man in his striped poncho, each woman in thick shawl and voluminous heavy skirts. The one thing they do not wear is shoes—and that in a climate where blizzards are to be expected as often as the wind shifts.

Gold is found on the eastern side of the mountains, where the country takes on a far different aspect. Stretching away to Brazil is the wide Montaña, a great alluvial plain thickly covered by

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OVER THE WORLD'S HIGHEST PASS ON THE CENTRAL RAILWAY

Perú has one of the world's most remarkable railways. It starts at Callao, ascends 15,645 feet in less than 150 miles, splits, runs north to Cerro de Pasco and south to Huancayo. There are 67 bridges and 65 tunnels, but not a foot of rack and pinion line. Here the train is nearly as high above the sea as the top of Mont Blanc.

© E. N. A.

AYMARÁ POTTERS in bright ponchos and knitted caps are typical of the Indians seen on the streets of Cuzco. That so much Inca stonework like this massive old wall remains intact is a striking tribute to the patient skill of the builders, who used no mortar, yet fitted the great stones so carefully that a knife-blade cannot enter the cracks.

EWING GALLOWAY

THE PORTALS OF THE PAST at Tiahuanaco are older than the Inca buildings of Cuzco and fully as wonderful, for the men who built this massive gateway were the ancestors of Indians over whom the Incas ruled. The Indian standing here is of ancient race, but he lives in a dreary village near the once-splendid city of his forefathers and leads a life less civilized than theirs. Among the mysterious ruins of Tiahuanaco are remnants of temples and palaces, and a great rectangular enclosure marked off by huge stone monoliths curiously carved.

SMELTERS AT OROYA ON THE CERRO DE PASCO RAILROAD

Cerro de Pasco first gained its reputation as a silver mine three hundred years ago. To-day it produces immense quantities of copper, and, in comparison, little silver. The ore often assays 10 per cent, but it occurs at an altitude of 14,000 feet, which has caused many difficulties in the construction and operation of smelters. The smelters above are at Oroya 70 miles from Cerro de Pasco and 2,000 feet lower. They take care of the ore from the Morococha copper mines. The stream is the Rio Montaro, which is the outlet of Lake Junin near Cerro de Pasco.

tropical forest and jungle. The Ucayali and other large rivers cut through it, flowing north to join the Amazon, which, as the Marañon, rises in the Andes of northern Perú and then breaks through the mountain wall on its way east to the far Atlantic. The Indian tribes of the Montaña are savages with limited knowledge of agriculture; they exist largely by hunting, and for houses build simple huts of wattles and mud. They are expert canoeists, since the waterways here are the only highways.

The Montaña has both rubber and timber. Indians were formerly pressed into service by the white and half-breed traders, and cruelly treated if they did not bring in sufficient rubber. But now that wild rubber is less important in the markets of the world than it once was, they are not much oppressed by traders. Perú has a river-port back in this wilderness, an important commercial town—Iquitos, on the upper Amazon. From here rubber, ivory nuts, lumber, coca leaves and Peruvian bark are shipped down the great river through Brazil to Pará and the outside world. Until recently it was easier to reach Iquitos from Lima by going clear around via Buenos Aires and Pará than by crossing the Andes and struggling through the jungle. Now there is air service between Iquitos and Lima, bringing within a few days of each other the coast and the far interior. Perú should benefit from the development of aviation as much as Colombia, for her transportation problems are fully as difficult.

In the adjoining republic of Bolivia also, life would be vastly different were it easier to travel from one place to another. What is more, Bolivia lies close to the heart of South America, entirely cut off from the sea. To reach the Pacific, the tin and silver from her mines must cross either Perú or Chile. Rubber from her northern forests is shipped clear

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BEAUTIFUL TILE-WORK IN THE DOMINICAN CHURCH AT LIMA

Lima lies in the valley of the River Rimac, with the Andes at its back, and the Pacific seven miles distant in front. Its history has been one of revolution, siege and earthquake, but from all these it has recovered, to display itself in greater dignity, richness and beauty than before. This is a vista in the cloisters of the Dominican Church.

ANCIENT PERUVIAN POTTERY was fashioned without a potter's wheel, but the variety of design and coloring fully made up for this defect in technique. Human faces, crayfish, mice and two different kinds of birds may easily be picked out among the decorations on these bowls and jars. The quaint, conventionalized little human figure is holding coca leaves like those the Peruvian Indians chew to-day. The water-jars have narrow spouts to prevent rapid evaporation, and the second spout makes pouring easier by letting in air.

BOLIVIAN INDIANS have actually become less civilized in many ways since their conquest by the Spaniards, and their Christian feast days are much like ceremonies in honor of the Sun God whom their forefathers worshiped. Such celebrations usually become riotous by night, for both Aymarás and Quichuas like to drown their troubles in drink. The stiff skin breastplates and strange hooped hats are special fiesta finery, but the trousers with the slit up the back of the leg, showing the white underdrawers, are typical of the Aymará costume.

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BOAT-BUILDING TWELVE THOUSAND FEET ABOVE THE SEA

Lake Titicaca, on the boundary between Perú and Bolivia, is the highest large lake in the world. The Indians on its shores use boats called balsas, which are built of bundles of reed bound together and shaped rather like a canoe. When finished they support a mast and a sail made from horizontal reed strips. Some balsas are large enough to carry mules or llamas.

across Brazil by river and rail. Crops from the fields around Santa Cruz go out by way of the Paraguay River and Buenos Aires. Yet at that it is easier to get in and out of the country from either the Atlantic or Pacific than to get from one end of it to the other. If one enters from Perú by way of Lake Titicaca, the countryside seems much the same as that left behind. The altitude is still very great—over twelve thousand feet. Snow whitens the surrounding mountain peaks, and sparse crops of barley or potatoes grow on the lake shore. Here and there the low huts of an Indian village blend into the background of fields and rocky slopes. One sees not only Quichuas but many Aymarás, who dress in much the same general way as the Quichuas, with styles in hats and caps varying from village to village.

Both races are very poor and live under miserable conditions. The majority are probably as badly off as were their forefathers under Inca rule. They work industriously for the owner of the hacienda on which they happen to live, and which they rarely leave. Peonage, or debt slavery, is quite general. Yet these Indians form much the greatest part of the population in both Perú and Bolivia, and any real development of either country depends upon them.

Peoples of mixed Spanish and Indian blood form a somewhat distinct class in Bolivia. As in Perú, they are called "cholos," which is equivalent to the word "mestizo" used in most Spanish-American countries. The Bolivian cholos are often found as shopkeepers in the towns and cities, and are fairly well-to-do. The women wear a distinctive hat, shaped like a tall derby but made of white straw very heavily varnished. A chola is scarcely ever seen without this precious piece of clothing; she seems to value it more highly than her gorgeous silk shawl or her high white kid shoes.

Indians, cholos and most of the whites live in the mountainous western part of Bolivia. The great high tableland around Lake Titicaca is bordered on each side by the Andes, which here extend over a wider east-to-west area than elsewhere. Although spread out, they are none the less high; Mt. Sajama and Mt. Sorata tower more than twenty-one thousand feet into the air. Only Tibet and the Himalayas may be called the roof of the world.

La Paz itself, the chief city, is the world's highest capital. It has a singular location in a deep canyon of the central Andes. Though less romantic than Lima it is rather more picturesque, and the rocky sides of the canyon seem like stupendous walls built roundabout to protect

the red-roofed houses and the church towers. Oddly enough the legal capital is Sucre, farther south, but the government has its headquarters at La Paz, which is the commercial and railway centre as well.

Railway building is so costly and difficult that much of Bolivia's mineral wealth lies untouched in the rocky hills. Tin and silver are the two metals produced in greatest quantity; one-fourth of the world's tin supply comes from the Bolivian Andes, while the silver mines of Potosí have been famous for generations.

The Spaniards never got very far beyond the Andean section. They preferred the cool air of the high plateau to the heat of the semi-tropical llanos and the Chaco wilderness. Consequently the greater part of the country is only now being opened up. There are tropical valleys which if intensively cultivated would make it unnecessary to import food for the non-agricultural plateau. As it is, Indian porters and pack trains of llamas or mules carry fresh fruits, sugar and coffee up to La Paz every week, converging at the market there on Sundays.

Like the Peruvian Montaña, tropical Bolivia is inhabited chiefly by primitive hunting tribes very different from the Indian folk of the plateau. The forest Indians have never been anything but savages. The Aymarás and the Quichuas may be poverty-stricken and degenerate, dulled by chewing coca leaves and drinking chicha, but they come of a stock which has proved its ability in the past. Their forefathers developed a civilization well suited to their own needs. In Inca days and earlier, Bolivia and Perú supported a far greater population than now. Bolivia has many relics of the past, and the ruins at Tiahuanaco are evidence of a civilization far older than the Incas—as old, perhaps, as the pyramids of Egypt. It will be interesting indeed to see how these Spanish-Indian lands ultimately develop.

NO ONE KNOWS HOW OLD IS THE GATEWAY OF THE SUN

Near the southern end of Lake Titicaca are the ruins of a very ancient city called Tiahuanaco, built long before the time of the Incas. This great gateway stands in the Temple of the Sun, and one archæologist describes it as "the most remarkable ruin in America." The central figure is the carved image of the Sun God.

EWING GALLOWAY

NATIVE CLOTH in Andean lands like Bolivia and Perú is woven from the fleece of the llama, the "camel" of South America. With yarn which they spin as this woman is doing, Quichua and Aymará women make their heavy woolen shawls and thick skirts. The more skirts a woman has, the happier she is, and she always wears all of them at once.

EWING GALLOWAY

A NATURAL GATEWAY of rock near Tupiza in Bolivia determines the route by which pack trains get through the mountains. Andean trails are often bad; they are rough and steep, now buried in snow and now swept by bitter winds, and hailstorms are frequent in the winter season in these highlands ten or twelve thousand feet above the sea.

H. J. Kitchen

LLAMAS ARE INDISPENSABLE PACK ANIMALS IN BOLIVIA AND PERÚ

The llama of the Andes is a unique creature, related to the camel but having no hump. The Incas had no other domestic animal, and llamas are still important both as beasts of burden and as wool producers, furnishing the Indians with material for most of their clothes. The alpaca, a cousin of the llama, yields some of the softest wool in the world.

BOLIVIA AND PERÚ: FACTS AND FIGURES

PERÚ (Republica del Perú)

Bounded north by Ecuador and Colombia, west by the Pacific, south by Chile, east by Bolivia and Brazil. Area, 532,047; estimated population (1927), 6,147,000, not counting uncivilized Indians. The executive power is vested in a President elected for 5 years; legislative power in a Senate (35 members) and a House of Representatives (110 members) elected by direct popular vote. For local government, the republic is divided into 20 departments and 3 provinces. There are 3 regional legislatures. Chief agricultural products are sugar, cotton, coffee, wool, hides and skins. Attention is being given to growing cocoa, wheat and rice. Tobacco, wines and spirits, olives, ramie, rubber and corn are also produced. Valuable tropical forests provide cabinet and medicinal woods. Stock-raising is important. Abundant mineral wealth includes petroleum, silver, gold, coal and copper. Chief exports: petroleum, cotton, copper, sugar. Imports: provisions, machinery, cotton goods, iron and steel manufactures. Railway mileage 2,810; largely state-owned; telegraph wire, 12,853; telephone wire, 40,420. State religion Roman Catholicism but all creeds tolerated. Education free and compulsory between ages of 7 and 14; 3,567 primary schools; 110 secondary schools, 8 normal schools, special schools for Indians and 4 universities. Chief towns: Lima, the capital, population (estimated, 1928), 265,000; Callao, 77,000; Arequipa, 65,000; Cuzco, 35,000; Chiclayo, 30,000.

BOLIVIA (Republica Boliviana)

Bounded north and east by Brazil, south by Paraguay and Argentina, west by Chile and Perú. Area, 514,155 square miles; population (1929 estimate), 2,974,904. Executive power is vested in a directly elected President; legislative power is vested in a Congress of 2 houses—a Senate of 16 members and a Chamber of Deputies of 70 members. About ¾ of entire area is undeveloped. The main wealth is in minerals and rubber. Bolivia produces ¼ of the total tin output of the world. Other minerals are silver, lead, copper, zinc and antimony (ranks second in world production). There are large deposits of common salt. Exports: Tin, lead, copper, zinc, antimony and rubber. In the cultivated area, potatoes, cacao, coffee, barley and rice are grown. Imports: sugar, flour, coal, iron and steel products, mining machinery, textiles, clothing. Railway mileage, 1,384; telegraph line, 5,927; telephone wire, 2,870. Recognized religion, Roman Catholic, but other religions allowed. Primary instruction free and compulsory; 1,598 elementary schools (1926). Besides secondary and special schools, there are 2 universities. Estimated population of chief towns: La Paz (actual seat of government), 146,930; Cochabamba, 36,196; Potosí, 34,083; Sucre (capital), 34,577.

THE WORLD'S THINNEST COUNTRY

Chile Stretches from the Tropics to Cape Horn

A land more strangely shaped than Chile can scarcely be imagined. Only huge Brazil is as long from north to south; only Argentina stretches over equally varied climates. Chile begins nineteen degrees south of the Equator, and ends about ten degrees from the Antarctic Circle. The Andes border it on the east, down its entire length, so that it seems little more than narrow coast and high mountains, but the Vale of Chile is one of the most fertile spots on earth, rivaling California as a paradise for both farmers and tourists. The Chileans are conscious of their country's great resources, from the nitrate deserts of the north to the timberlands and sheep farms of the far south. They are an energetic and ambitious race, and their relatively small land has long been a power in South America.

AMONG the republics of South America, Chile occupies a peculiar niche of its own. Its geography is unique: a strip of land nearly twenty-seven hundred miles long, never more than two hundred and fifty and usually less than one hundred miles wide—that is Chile. Here is no vast hinterland of forest and plain, no immense tableland far from the sea. The lofty Andes, narrowed to one main range, form a definite barrier all the way down the long border between Chile and her eastern neighbor, Argentina. From north to south along much of the coast runs a continuous range of lower mountains, and south of this clear to Cape Horn is an archipelago of wooded islands and a narrow strip of mainland backed by the Andes. The famous nitrate beds are in the desert country of northern Chile, above Coquimbo. In this extremely arid land, where the nitrate beds are quite bare of vegetation, men work hard in dust and heat under a pitiless sun, to extract and prepare for use the valuable fertilizer, which, itself occurring in a desert, is sent all over the world to make other lands more fruitful. Between the barren desert of the north and the rainy forests of the south there is a stretch about six hundred miles long, which is the very heart of the country and is known as the Vale of Chile. Here the valleys are comparatively narrow; nowhere does one lose sight of the rounded mountains of the coast or of the snow-clad Andes on the eastern horizon.

That such a curiously long and thin ribbon of land could ever form one nation seems impossible. Yet the Chileans have developed the wealth of their country, such as it is, with great industry. From the beginning they have been faced with real difficulties, which seem only to have stimulated still greater national development. The Indians of Chile fought off invaders more stubbornly than did any other tribes in the whole hemisphere. The Incas were never able to extend their empire much farther south than the Rapel River, in Santiago province. Below that the "warrior people," or Araucanians, fiercely resisted conquest. They were the most formidable of the tribes encountered by the early Spaniards, who were no more successful than the Incas. Diego de Almagro marched down from Perú in 1535, while Pizarro was busy subduing the Incas, but the hardships of the mountain journey and the resistance offered by the Indians made him turn back. It was Pedro de Valdivia who really began the conquest and made some headway, yet in the end the Araucanians killed him. After that the struggle went on for a century; the Spaniards would push south and erect forts, only to have the Araucanians burn them, until at last a treaty was made by which both parties agreed to recognize the Bío-Bío River as a boundary. Later yet the Indians were conquered, and though still retaining a certain independence, they are to-day restricted to special reservations in the southern provinces of Chile.

THE ATACAMA DESERT is one of the great arid districts in northern Chile. Much of this region is as barren as the eroded hills in the background, and a stretch of land with water enough to supply cactus and thorn bushes is a welcome relief to travelers weary with the glare of the sun on bare sand and rocks. Huge cactus plants grow up in many fantastic forms showing a strange beauty all their own, and give a touch of contrast to the reddish landscape. The foremost rider is wearing the poncho so popular for country use in Chile.

COURTESY OF CHILE MAGAZINE

THE "CHILEAN SWITZERLAND" in the southern province of Chiloé is a country of lakes, woods, glaciers and volcanoes, with heavy rain nine months of the year—as different as possible from the barren northern deserts. In summer southern Chile has a delightful climate which brings out all the beauty of its alpine scenery. This is a corner of Lake Todos los Santos (All Saints' Lake), and the lovely snowy peak is Mt. Puntiagudo. The lake was once part of nearby Lake Llanquihue but lava from a volcano divided the water.

MEMBERS OF A DWINDLING RACE

A few Araucanians live in scattered villages in southern Chile; their tiny huts are thick with smoke and crowded with children and miscellaneous possessions. The men love bright red ponchos, and the women treasure heavy silver ornaments which are passed from mother to daughter. Colored woolen girdles complete their picturesque appearance.

During colonial days—and indeed up to our own times—Chile was very much isolated. What merchandise she sent to the mother country had to go up over the mountains and across the continent to Buenos Aires, or to Perú and on up the west coast to Panamá, or else clear down around stormy Cape Horn and all the thousands of miles across the great Atlantic, to Spain. Little gold existed in the Chilean Andes, and immigrants were consequently few. Those who did come settled in the Vale of Chile, far from all other Spanish colonists; they had to fight off Indians constantly, and work hard for a living. Only a few great landowners became rich. During the latter part of the eighteenth century re-

Courtesy of CHILE Magazine

CONDITIONS THAT ARE PASSING

The ox was once the universal animal for heavy farm work in Chile, and we still see oxen in the rural districts. But tractors and steel plows are replacing ox-teams and old, ineffective wooden plows like that in use on this farm of southern Chile, and the thatched huts of the laborers are being torn down in places to make way for comfortable modern dwellings.

Courtesy of CHILE Magazine

SUNLIGHT AND SHADOW ON COOL WATER

This double yoke of oxen, stopping for a drink as they cross the ford with their load of hay or fodder, belong far from the low mountains of southern Chile and the farm shown above. The pleasant shady stream is near the city of Limache, inland from Valparaíso. By looking closely, you can see the long goad in the horseman's hands.

Rivas Freire

HOW THE CHILEAN MANTO IS WORN

The manto may be draped in many graceful ways. It is still the accepted garment for church-going, although supplanted in ordinary wear by Paris styles lacking its peculiar charm.

newed immigration from northern Spain much strengthened the country.

The revolutionary impulse which swept the rest of Spanish-America about 1810 reached Chile. Independence was won in 1817 with the help of the Argentine General San Martín, who led his men in a remarkable march over the Andes, and upon the defeat of the royalists, Chile became a republic. Two parties, the Conservatives and the Liberals, opposed each other during the nineteenth century and about 1891 engaged in a bitter, disastrous civil war, but the Conservatives were usually in power. They gave Chile a strong though not very democratic government, and guided the country through more than one conflict with its northern neighbors, Perú and Bolivia. In the War of the Pacific (1879-83) Chile greatly increased its territory, acquiring the desert lands so rich in nitrates and copper. For a time the country depended too much upon this new wealth, but now other resources are being developed.

A railroad links Chile together all the long way from desert country to islands. Starting at Arica in the dry northern provinces, where the tropical sun is very hot by day and the nights are quite cool, the line traverses the fertile, pleasant valleys of central Chile and comes at last to the edge of the southern archipelago at Puerto Montt, where steamers start for Punta Arenas (Magellan) on the Straits of Magellan. Always, on the left, the horizon is shut in by the mountain backbone of the continent. The peaks of northern Chile are as high as any in the whole chain, and the greatest one of all, Mt. Aconcagua (23,000 feet), lies just over the border in Argentina. Toward the south the mountains are lower—five and six thousand feet, instead of fifteen and twenty thousand.

The southernmost tip of the continent is the archipelago of Tierra del Fuego, which is divided between Chile and Argentina. The grassy plains on the main island—also called Tierra del Fuego—used to be over-run with guanacos, cousins of the llamas. Now sheep-farms occupy the territory, producing meat, and fine wool which takes dyes very well. Between the smaller islands the sea winds in narrow channels shut in by steep mountain walls that soar up toward the sky, their summits capped with snow. Rich green forests grow beside huge glaciers and dense fog alternates with brilliant sunshine, so that no land offers more startling scenic effects. The Alaculuf Indians frequent these sheltered waters, paddling their canoes between the echoing precipitous walls. There are two other dwindling tribes in Tierra del Fuego—the Yahgans on Cape Horn and the outer archipelago, and the Onas on the main island.

Between the Straits of Magellan and Puerto Montt countless islands cut up the

ONE OF THE WORLD'S MOST ROMANTIC ISLANDS

Away out in the Pacific, three hundred and eighty miles off Valparaíso, is a spot which has become famous under another name. This is Más-á-Tierra, one of the Juan Fernández Islands, where the sailor Alexander Selkirk lived alone for over four years. His adventures suggested Robinson Crusoe to Defoe, and every child feels familiar with the island.

coastline for hundreds of miles. Oaks and pines thrive on the cool rain-drenched hillsides, for this part of Chile is as far south as Canada is north, and the climate is temperate. The seasons, of course, are just reversed—January and February are summer months, and July and August the heart of the winter. Yet no place in Chile—except above the snowline—are the winters extremely severe, because no part of the country is very far from the ocean. The southern forests furnish material for many sawmills, and lumbering is important. The other main occupation of this thinly-settled district is stock-farming. Sheep, especially, are being raised in increasing numbers. Where the hills are not heavily wooded, the rugged, rainy country quite resembles Scotland, and many of the sheep farmers are Scottish immigrants. Some settlers have come from Switzerland and England, and there is a German colony near Valdivia. The few remaining Araucanians live in southern Chile. They are short and sturdy-looking with coarse black hair and copper-colored skins, but the race is dying out from the effects of disease and alcohol.

The rainfall which is so abundant in the islands comes much less frequently in central Chile. There a long dry season makes irrigation necessary, and it is feasible also, thanks to the many short rivers which rise in the snows of the mountains. And as the soil is exceedingly fertile, the Vale of Chile is a veritable garden spot. The flowers are brilliantly beautiful—roses of a size and profusion which make one stare, purple bougainvillea, asters pink and blue, daisies yellow and white, golden poppies, zinnias of all colors and many less familiar flowers. Nowhere else grow such grapes, such peaches, apples, oranges, plums. The vineyards about Santiago are especially famous. The very trees grow more quickly than elsewhere, and lanes of poplar or eucalyptus line the roads. There are potato fields white with blossoms, wheat fields, green young alfalfa, and patches of vegetables. On the pasture lands graze the

TRAVELERS AND THEIR MULES CROSSING A WIND-SWEPT PASS

Even where the white crests of the Andes seems to form an impassable barrier, intelligence and patience have found a way through, and men and mules have followed difficult trails over the same high passes for centuries. The heat of the Vale of Chile is far behind when the pack-train reaches the region of eternal snow, and the Argentine border is near.

VALLEY OF THE COAST RANGE NEAR OCOA

The Cordillera de la Costa is the low coastal range that runs more than half the length of Chile. Between it and the high Andes are many narrow little valleys where the soil is amazingly fertile when irrigated. Ocoa is not far from Valparaíso, and this part of the country is quite far enough north for palms and other tropical plants.

THE CHRIST OF THE ANDES, IN THE USPALLATA PASS

In 1901, Chile and Argentina were on the verge of war over a boundary quarrel, but instead of fighting, they submitted the dispute to arbitration and signed a general arbitration treaty. As a reminder of the peace to be maintained, they melted down old cannon and cast this colossal bronze statue of Christ, which stands on the border between the countries.

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DEEP SNOW-CUTS ON THE TRANSANDINE RAILWAY

Two thousand feet below "the Christ of the Andes," the Uspallata Tunnel of the Transandine Railway joins Argentina and Chile. From Valparaíso to the tunnel the trains climb more than 10,000 feet in less than 130 miles. Part of the way is so steep that rack and pinion construction is necessary. Snow often closes the line in winter months.

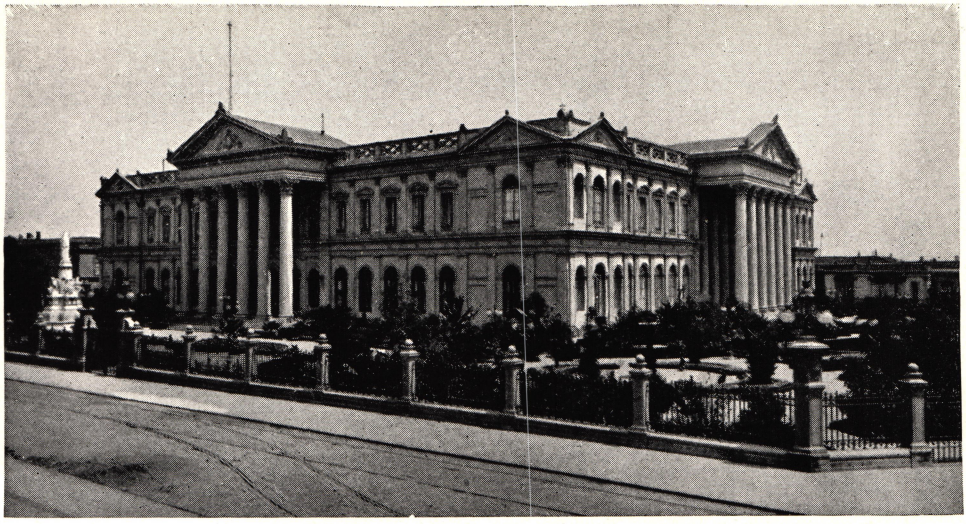
strong beautiful little Chilean horses, for which the country is famous. Every Chilean of means has his riding horse, and racing is a popular sport.

The ranch-owners have spacious homes set among orchards, vineyards, gardens and meadow, for this is a country of large estates. One sees few barns, however, as the climate is not severe enough to necessitate shelter for ordinary stock. Peons form the mass of the population and are employed in great numbers in the haciendas. "Peon" or "roto" or "Inquilino" is the term applied to a laborer in Chile; the rotos are part Indian and part Spanish, and very sturdy. Most of them live in miserable one-room huts on the haciendas, or in corrugated iron hovels in cities like Santiago. The government, realizing that such living conditions mean a high death rate, is now endeavoring to make the roto's life at once more sanitary and more pleasant. Health education is carried on through the schools, while some hacendados and large companies have built model villages for their employees. The hacendado rules his estate with feudal authority and often the farming is done by methods older than feudalism. As modern implements come into use one may see tractor plows working almost alongside of old wooden plows which are little more than crooked sticks.

Every horseman from hacendado to cowboy wears a poncho. This inevitable and indispensable all-weather garment is usually of some bright color—red, or tan with contrasting stripes and border. As a man sits his horse, the poncho falls in graceful folds below his hips, almost to the tops of his high leather boots. A wide-brimmed hat, huge spurs and elaborate stirrups complete the picture. The other costume typical of the country is the black manta still worn by Chilean ladies for church-going, although nowadays less frequently seen on the streets of Santiago than formerly.

GLIMPSE OF THE CROWDED DOCKS AT VALPARAÍSO

The largest seaport on the west coast of South America is a busy place. Steam cranes and stevedores are perpetually at work loading great ships bound for Liverpool, Bremen, Yokohama or other ports. A liner from New York may anchor alongside a coastal steamer from Punta Arenas on the Straits of Magellan, and tugs and lighters nose about between big boats.



THE NATIONAL CAPITOL IS ONE OF SANTIAGO'S MANY FINE BUILDINGS

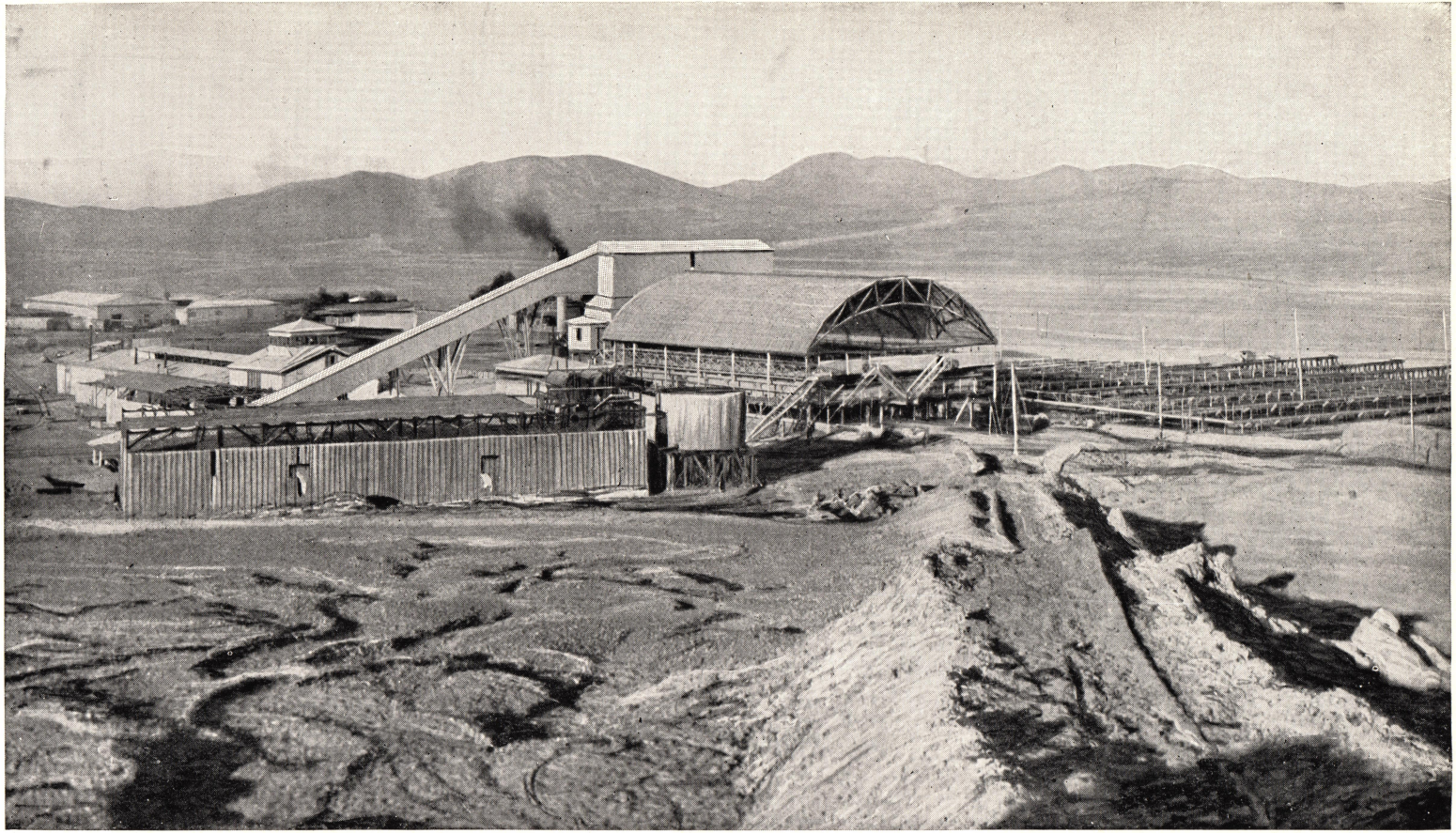
The Chamber of Deputies and the Senate make up the National Congress of Chile, and in this beautiful Capitol the representatives assemble annually from May to September, during the Chilean winter. The President's palace, La Moneda, is a fine old Spanish structure which has been carefully restored and remodeled without losing the charm of its colonial style.

Santiago is one of the world's beautiful cities. It lies on a plateau midway between the Andes and the coastal mountains. The Mapocho River cuts through it, fertile vineyards surround it, and the rocky hills of Santa Lucia and San Cristóbal rise sharply above its roofs. Pedro de Valdivia chose the site and started the capital in 1541; could he see it to-day, he might well feel proud. It is a city of wealthy families, who have not only built fine residences for themselves, but have helped to enrich Santiago with magnificent parks, boulevards and public buildings. There is the Alameda, three hundred feet wide and lined with statues of Chile's great men; it occupies the old channel of the Mapocho, which was diverted to make way for it. There is the Plaza de Armas, formerly a favorite spot for promenaders—girls with their duennas, boys in their best clothes, each group much interested in the other, parading back and forth in front of the Cathedral. But the most beautiful spot of all is the Cerro Santa Lucia. This abrupt pile of rock used to be the citadel, long ago. Now it is a park, and skillful landscaping has transformed it until it seems completely overgrown with foliage. Handsome gates and stairways lead up to enchanting hanging gardens and at every turn one comes upon a fountain or a monument, or a bench where one may sit and gaze out over Santiago to the towering mountains beyond.

The houses are low on account of the constant danger from earthquakes, but they are nevertheless large, and often spread out around more than one tree-shaded patio. Many church towers and a few skyscrapers stand out above the roofs. Santiago is a prosperous city, very modern in many ways, yet at the same time quite conservative, as might be expected in a place where the standards of social life are set by a few old families.

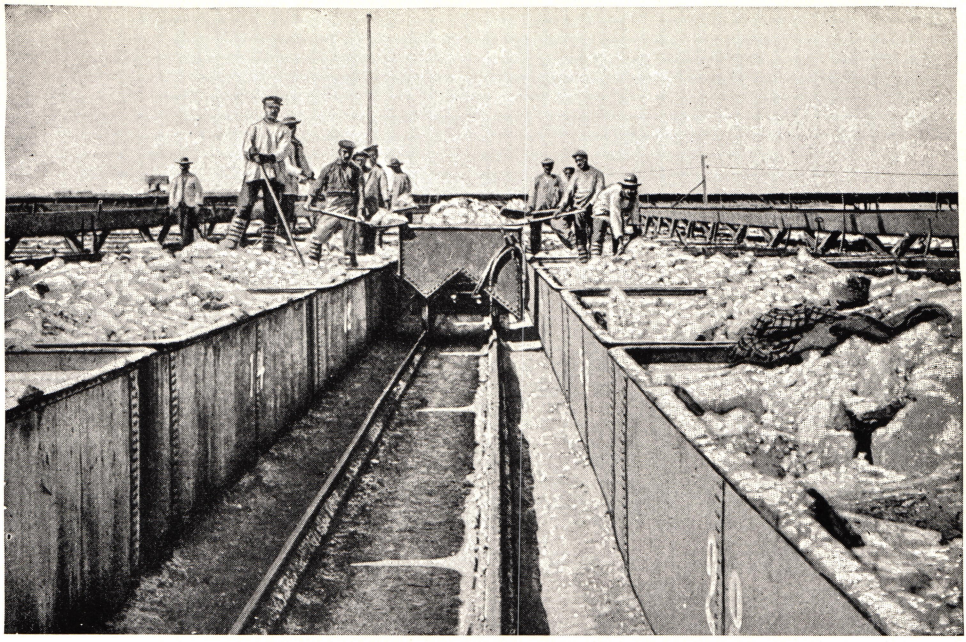
The railroad to the north connects both with Valparaíso on the Pacific and Buenos Aires on the far Atlantic. At the little town of Los Andes one transfers to the famous Transandine Railway, where the train bound for Mendoza and Buenos Aires starts on its way up the mountains to the tunnel which, since 1909, has pierced the mountain summit and so saved the difficult journey over the crown of the Uspallata Pass. Two more railroads across the Andes between Chile and Argentina are under construction.

Valparaíso is the largest seaport on the Pacific south of San Francisco. Like



FROM BARREN PLAINS IN NORTHERN CHILE COMES FERTILIZER FOR THE FARMS OF THE WORLD

This nitrate "oficina," or refinery, is typical of many. The nitrate deserts begin four hundred miles north of Valparaíso, and extend for five hundred miles more. That such a desert of rock and sand should contain immense potential wealth in the form of fertilizer is amazing. Millions of tons of sodium nitrate have been shipped all over the world; the United States alone, in the one month of February, 1929, consumed more than 110,000 tons. While the nitrate desert is not wholly rainless it is probably the driest region in the world.



RECRYSTALLIZED SODIUM NITRATE READY FOR EXPORT

The nitrate deposit in its crude state is called "caliche," and must be separated from earth and rock by being boiled in water which already contains a solution of sodium nitrate. While still liquid it is then run off into these crystallizing tanks, where the pure nitrate forms in new crystals, ready to be packed up in sacks for export.

Santiago, it is just about halfway down the long narrow strip of Chile. Merchandise for many different parts enters the country here, not to mention consignments for Buenos Aires via the Transandine; while shipments of fruit and vegetables for North American winter markets go north through the Panamá Canal in increasing quantities. The busy harbor is three miles across, forming a great semicircle at the foot of the hills along the shore. The business section of the city is built down on the waterfront, while the residential district is several hundred feet up the hillside. The different levels are connected by long flights of steps and cog railways almost steep enough to be elevators. These contrivances are called ascensors; they have double tracks with a square car on each and as one car ascends the other descends. The trolley cars in "down-town" Valparaíso are double-deckers, and the conductors are women, which is a state of affairs dating from the War of the Pacific. The streets are full of peddlers carrying baskets of fresh foodstuff or driving horses and donkeys laden with full panniers and pack-saddles. Strapped to the saddles may be anything from strings of fish to twenty-foot timbers.

Just outside of Valparaíso is Chile's most fashionable seaside resort, Viña del Mar. The hillsides of this aristocratic suburb are brilliant with gardens, and the curving shore is lined with pavilions, handsome houses and fine driveways. There is a bathing beach, of course, but the water of the Pacific at this point is decidedly chilly, for the cold Humboldt current sweeps past off the coast.

This current and the height of the Andes combine to produce the dry climate of northern Chile. It is the lack of rainfall which conserves the great nitrate beds; rain would wash away the protecting topsoil and quickly dissolve the deposits themselves. The beds are very extensive: every year between two and three million tons of the fertilizer are exported, and the supply is nowhere near exhausted. When the surface earth has been blasted away, the nitrate-bearing rock is dug out with pick and shovel and transported to

Gallardo Bros.

CHUQUICAMATA LIES IN THE SHADOW OF THE ANDES

The copper mines of Chuquicamata are among the largest in the world. A glance shows the great extent of the plant, which is very well equipped and easily capable of handling a hundred thousand pounds of ore a day. Some of the ore is so accessible that it can be mined with steam shovels. Copper from Chuquicamata is shipped through Antofagasta.

MINES IN THE CRATER OF AN EXTINCT VOLCANO

Great deposits of copper occur all around the jagged rim of the old crater of El Teniente, and getting the ore out of this deep hole in the ground is no easy job. El Teniente is near Rancagua in central Chile, south of the principal copper-mining districts. Chile ranks next to the United States in the world's production of copper.

the "oficina," or refinery. It is shipped from the five nitrate ports—among them Antofagasta and Iquique. Arica is the border port which Chile now shares with Perú, and from it a railway leads to La Paz in Bolivia. Iquique literally depends on nitrate. Were fertilizer not needed on farms from England to Nebraska, the city would cease to exist. All food, clothing and building materials must be brought from elsewhere—the desert round about provides nothing but nitrate. Water is piped seventy-five miles. Yet nearly forty thousand people live here at the foot of the steep barren coastal mountains, and the harbor is always dotted with ships loading nitrate and smaller quantities of iodine, the valuable by-product of nitrate.

Antofagasta ships not only iodine and nitrate, but borax, silver, copper and Bolivian tin. The borax comes from lakes high up in the Chilean Andes. This is the second largest port in the country, and with reason, for another railway to Oruro and La Paz starts here, and some of the world's most important copper mines are near by. Chile produces more copper than any other land except the United States. Iron and coal also occur in valuable quantities—the iron near Coquimbo, and the coal far to the south, around Concepción. Some of the coal fields extend under the ocean, and one mine has pushed its tunnels out through the rock beneath Coronel Bay.

Chile is rich not only in minerals but in scenery. The mighty Andean peaks form a background for every part of the country. Mt. Aconcagua, though itself in Argentine territory, can be seen for miles down the valley of the Aconcagua River, which empties into the sea near Valparaíso. Tupungato, Juncal and El Tronador are three impressive Chilean peaks. Southern Chile boasts a lake and mountain district which rivals the Alps. Some day tourists will discover Lake Llanquihue and Lake Todos los Santos, and travel far to view the perfect white cone of Mt. Osorno.

CHILE: FACTS AND FIGURES

THE COUNTRY

Bounded north by Perú, east by Bolivia and Argentina, south and west by the Pacific. Total area, 290,119 square miles; population (1931 census), 4,264,819. Juan Fernández Islands lie in the Pacific Ocean about 360 miles west of Valparaíso and have less than 100 inhabitants. Easter Island lies in the Pacific Ocean 2,000 miles from Chilean coast; area, about 45 square miles; population less than 100.

THE GOVERNMENT

Republic divided into 16 provinces and 2 territories (Magallanes Territory includes the western portion of Tierra del Fuego). By the constitution which came into force in 1925, legislative power is vested in a National Congress consisting of Senate (45 members) and Chamber of Deputies (132 members). Executive power is vested in a President, assisted by a Cabinet and elected by direct popular vote for 6 years.

COMMERCE AND INDUSTRY

Mining and agriculture are the chief industries. The country is divided into 3 zones—the arid zone in the north which furnishes the world's entire supply of natural nitrate of soda, 90% of its iodine and 18% of its copper; agricultural zone in the centre; and the forest zone in the south. Other mineral deposits include gold, silver, cobalt, manganese, coal, salt, sulphur and iron ore. Agricultural products include cereals, wine, fruit and vegetables. Stock-raising, dairy-farming and forestry are important industries. The chief exports are nitrate, copper, iodine, sheep's wool, fresh and frozen meat, barley, oats and beans; imports are iron and steel manufactures, sacks for nitrate, railway supplies and tools, vehicles, sugar and petroleum.

COMMUNICATIONS

Length of railway line, 6,752 (1929) state-owned and British-owned. Length of telegraph line, 19,808 miles; length of telephone line 47,017 miles. Wireless stations are being constructed. Regular air service established between Santiago and Buenos Aires, and from Santiago to Panamá and North America.

RELIGION AND EDUCATION

The Roman Catholic religion was maintained by the state until 1925 when it was disestablished. Education is free and compulsory for all children between the ages of 7 and 15. Besides special schools, including agricultural, mining and professional schools, there are 2 universities. Industrial universities have been opened at Valparaíso and Concepción.

CHIEF TOWNS

Santiago, the capital, population, 538,144 (1931 census); Valparaíso, 191,494 (1931); Antofagasta, 84,221; Concepción, 70,645; Viña del Mar, 52,871 (1931); Temuco, 44,000.

THE REPUBLICS OF ARGENTINA, URUGUAY AND PARAGUAY

LANDS OF THE SILVER RIVER

The Life of Argentina, Uruguay and Paraguay

Río de la Plata and Argentina mean, in the charming Spanish tongue, River of Silver and Silvery Land, but if you went to see for yourself the South American territories that are separated by the Silver River, your first impression might be disappointing. The Río de la Plata is a broad stream more like a sea than a river, and its muddy waters are yellowish-brown. Argentina, on its western bank, stretches away in unbroken flatness to the far horizon; little Uruguay on the northeast is slightly more undulating. These two lands are among the richest countries of the earth—rich in horses and cattle, wheat and corn, rich in almost anything but silver! Paraguay lies far up the Paraná River, which is the great tributary of the Plata. The inland republic is different from the other two; its climate is more tropical and its life less urban and cosmopolitan than that of Argentina or Uruguay.

EARLY in the sixteenth century, two or three great explorers sailed into the Río de la Plata, seeking a way to the Pacific. Juan de Solís was the first, and he lost his life in a fight with the Charrúa Indians of Uruguay. After him came Ferdinand Magellan, and later still, Sebastian Cabot. These adventurers were astonished at the number of silver ornaments worn by the Indians. Not knowing that the metal came from quite another part of the continent, they concluded that there were rich mines in the neighborhood, and gave the river its silvery title, which is now applied only to the combined estuary of two great streams, the Paraná and the Uruguay. Spain proceeded to annex the country, and the city of Asunción, now capital of Paraguay, was the first permanent settlement. Buenos Aires was founded the year before (1535), but the colony failed, and the present metropolis of South America was not finally established until 1580. Montevideo, the capital of Uruguay, was settled in the eighteenth century.

More and more colonists came over from Spain and gradually took possession of the country we now call Argentina, a wedge-shaped land, as large as Perú and Bolivia put together. From north to south, forming its western boundary, run the mighty snow-capped Andes with their plateaus and valleys. In the north the undulating, wooded plains of the Gran Chaco merge into tropical forest. Southwest are the pampas—treeless, grassy prairies with stretches of dry dusty desert, and still farther south the plains of Patagonia grow ever more barren and bleak as the land narrows.

The settlers found pumas, jaguars, small deer, guanacos and birds of many kinds, including a small species of ostrich called the rhea. There were no domestic animals and no cereals except corn. Horses, cattle, sheep, fruit trees and wheat they had to bring from the Old World. The Indians were hostile, Buenos Aires was twice attacked and abandoned, and the imported animals were set free to roam wild in the pampas. In this way started the immense herds of cattle and horses that long ago made the land famous.

Argentina was thus a ranching country in the beginning. Buenos Aires was its port and commercial centre, and in 1776 became the capital of the newly created Viceroyalty of La Plata, which included all Spanish possessions east of the Andes and south of Perú. La Plata revolted in 1810 and secured its independence in 1816; it was the gauchos, or cowboys of the pampas, who under the generalship of José de San Martín defeated the Spanish forces. But the gauchos and their leaders did not like to be ruled by Buenos Aires much more than by Spain, and as a result the city and the provinces were often at war. Uruguay and Paraguay broke away and formed separate republics, but throughout the large territory remaining,

Field Museum of Natural History

GIANT INDIANS OF SOUTHERN PATAGONIA WHO, WITH BOLAS AND LASSO, HUNT THE FLEET GUANACO

The Tehuelche Indians of southern Argentina were described by the early explorers as veritable giants over seven feet tall, and from the size of their feet the country was called Patagonia—the land of the Patagones, or big feet. It has since been proved that the Tehuelches do not average more than six feet in height, and the apparently abnormal size of their feet is due to the fur sandals they sometimes wear. They hunt the wild guanaco for its skin and meat, and are very skillful in using bolas, which are stone balls fastened to a rope and thrown with great skill.

a rough sort of unity was preserved by the dictator Rosas, who controlled the republic for over twenty years.

In the latter part of the nineteenth century Argentina began an immense national development. The first railway was built in 1857. To-day the railways spread out from Buenos Aires in all directions and carry the produce of the most distant parts of the country to the seaports. Immigrants have come from all over Europe to farm the vast pampas and build the growing cities. People of many nationalities—Italians, Russians, Englishmen, Spaniards, Germans, Swiss, Frenchmen, Hungarians, Austrians, Basques, Poles—pour into this wonderful country and help in the making of the Argentine Republic, which is still, from one point of view, in its infancy. Like all thriving young nations, it has an air of strength and vigor, and one feels, with the Argentineans, that here anything is possible.

Even distant Patagonia is no longer left to the Indians. Oil fields encroach upon the old hunting-grounds and sheep are herded where the guanacos used to graze. The skin of the guanaco is invaluable to the Tehuelche Indians, who are dying out as the herds disappear. The northern boundary of the Patagonian region is the great Río Negro, with its rich irrigated lands on either bank.

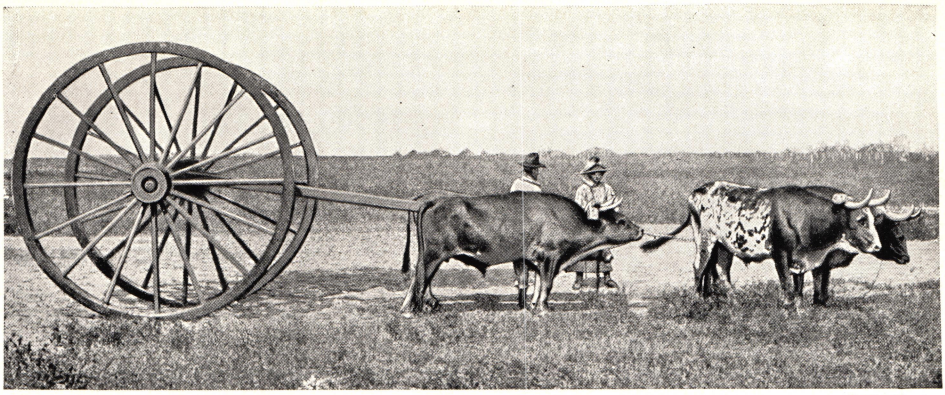
Between the Río Colorado and Buenos Aires the pampas stretch for miles on

STURDY PATAGONIAN PONY DOING TRIPLE DUTY

There were no horses in South America until the Spaniards introduced them, but now there are thousands upon thousands, and in Patagonia many run wild. The few remaining Indians are all expert riders and will never walk if they can help it. The three young Patagonians shown here are the sons of a Tehuelche cacique, or chief.

LIFE ON AN ARGENTINE ESTANCIA IS NOT ALL WORK

The gaucho is hard-working, but he also knows how to get amusement out of life. He will pick up a guitar and improvise accompaniments for his songs, which, after the Spanish fashion, he composes as he sings. Or he will dance just as readily, and it is said that the Argentine tango was originally a gaucho dance. The national sport of horse-racing is also popular here on the plains, where the gauchos organize fast, furious and informal races of their own. All of them, of course, ride as though born in the saddle, and they are equally expert with the lasso.



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ONLY VEHICLES WITH HUGE WHEELS CAN TRAVERSE THE PAMPAS

After a few days' rain a main road in Paraguay or the Argentine pampas will be more like a muddy river-bed than a road, and only oxen are strong enough to drag a wagon through the heavy mud. To keep the axles off the ground, the wheels are made very large, and they leave ruts two feet deep. On such roads, automobiles are useless.

miles. "Pampa" is an Indian word meaning "level," and it is a good name for these vast flat plains. Here a rider may often see the rheas running in flocks, and sometimes a horse will stumble into a nest of the big eggs. The American ostrich has plumes less valuable than those of the larger African bird, but is hunted for its feathers nevertheless. Corn, wheat, alfalfa and grasses all grow luxuriantly in the good soil of the pampas, in a climate that is never bitterly cold, nor yet too hot. Although there is an immense acreage given to grain, the pasture lands are much more extensive, for cattle can feed outdoors the year round and need no barns for shelter. Produce from the southern pampas goes out through Bahía Blanca, where huge grain elevators and docks remind us that Argentine corn and wheat are needed in many countries overseas.

Much of the pampas is held in huge estates, some of which cover as much as sixty thousand acres. These holdings make it difficult for "colonos," or immigrants, to become independent farmers, and so they usually work as laborers for the big landowners. The "estancias" are a combination of farm and ranch. They breed fine horses, cattle and sheep, and have developed new types suited to the country. A hundred years ago the cattle were raised chiefly for their hides, then the "estancieros" (ranchers) started to export frozen beef and mutton. This built up an enormous trade with Europe and the United States. To-day, the meat in a London butcher-shop often comes from the Argentine pampas, and the same may be true in New York.

The rich estancieros live in spacious houses in modern comfort and luxury. They are used to spending many months of the year in Buenos Aires or Europe, and their country homes reflect to some extent that cosmopolitan life. But around the great dwellings cluster unpretentious huts which house the many peons and gauchos necessary on a great estancia. The gauchos almost live in the saddle and their outdoor day's work, save for a brief siesta, lasts from sunrise to sunset. Meat and maté form their simple but generous diet, and they carry cuts of raw beef with them to be cooked over open fires. Yerba maté, or Paraguayan tea, is made from the dried and powdered leaves of a shrub grown in Paraguay. It is prepared in a gourd instead of a teapot and is sucked up through a "bombilla," a long tube ending in a bulb which is pierced with holes to strain off the liquid from the leaves.

The gaucho class was composed originally of the descendants of Spanish men who had married Indian women, and the gauchos were known for their impulsive temper and a liking for the wild free life of the pampas; they put loyalty to their employer, or "patrón," as they called him, above any laws which the government

at Buenos Aires might make, and in the civil wars they were a formidable fighting force. To-day the gaucho is more law-abiding and less picturesque, though he still wears baggy trousers, leather boots and a heavy belt in which to carry his knife, his whip and his money. As the prairie is given over more and more to agriculture and the stock farms are enclosed, the gaucho type tends to disappear, and the typical Argentinean today is likely to be a city dweller.

The Metropolis of South America

No city can rival Buenos Aires as the metropolis of Argentina and of all South America. It is easily the largest city of the southern hemisphere, and is surpassed in size by only nine other large cities the world over. The capital of a rich young country, it is ultra-modern. It is as fashionable as Paris, as expensive as London, as energetic as New York. It boasts beautiful mansions, big hotels, luxurious clubs, magnificent stores and office buildings. Narrow Florida Street epitomizes the growth and present prosperity of the city. In 1818 Calle Florida was the only paved street, and was well kept because it led to the now abandoned bull-ring. To-day it is the most fashionable street in the city and is lined with expensive shops, the names of which are familiar on the Rue de la Paix, Bond Street and Fifth Avenue. In the late afternoon all wheeled traffic is banished and the world of fashion promenades in elaborate and beautiful Paris clothes. At night the broad Avenida de Mayo is thronged with pleasure-seekers all the way from the Capitol to the great executive mansion known as the Red House. The theatres and picture houses are ablaze with lights. All the cafés have tables on the sidewalk, and we remember that Buenos Aires likes to call itself the Paris of South America.

Aristocrats and Immigrants

Yet there are indications that this is a Latin-American city none the less. The aristocratic homes offer typically lavish hospitality. Family life is a marked feature of the country; one will find married sons and daughters, with their own families, all living together in a palatial house that may contain from fifty to a hundred rooms. Many of the women have been educated in Europe or the United States, but they do not as yet take a full part in public life. Their comparative seclusion, together with their courteous manners and innate grace, is a legacy from their Spanish ancestors. But year by year more middle class women begin working as school teachers, stenographers, clerks and telephone operators.

It takes poor people as well as rich to make up a city like Buenos Aires. The immigrants who come from all parts of Europe are not likely to have very much money. The government takes care of these strangers on their arrival and maintains a comfortable hotel especially for them, near the docks in Buenos Aires. Here, without expense, a Hungarian or a Spanish family, for instance, may stay several days. After that they receive free transportation to the place where they wish to live, and to help them learn what the country is like, they are shown moving pictures of life in different sections. Many, however, stay in Buenos Aires, where work is less plentiful than elsewhere. The government conducts an employment bureau which not only helps the newcomer to a job, but draws up a contract between employer and employee, and makes sure that the working conditions are satisfactory.

In the Foothills of the Andes

From Buenos Aires we can go by express train across the pampas to Mendoza in the shadow of the Andes. Here is the Argentine terminus of the Transandine Railway, where begins the steep climb up over the mountains to Chile. The river rushing down from the heights has been used to irrigate the country and the city stands amid fruitful vineyards and gardens, where luscious grapes and vegetables are cultivated. The wines of Mendoza are famous throughout Argentina.

If we go up the Paraná from Buenos Aires we shall enter the great and varied

LOADING WHEAT AT THE BUENOS AIRES DOCKS

The port of Buenos Aires has row on row of these big grain elevators, dwarfing even the great freighters which are here being loaded with wheat. The docks are long enough and the harbor deep enough to accommodate the largest vessels, so that 50 per cent of Argentina's exports passes through Buenos Aires and many millions of tons of cargo are handled annually.

TRAFFIC KEEPS TO THE LEFT IN BUENOS AIRES

Everything moves swiftly along the most famous thoroughfare in Buenos Aires—the Avenida de Mayo, which stretches straight from the Plaza de Mayo to the Plaza del Congreso, where the dome of the Capitol completes the vista. The cars parked in the middle of the street effectively separate the traffic lanes. A subway entrance is visible under the trees on the left.

Photographs, Subirana

THE RAMBLA ALONG THE CURVING BEACH AT MAR DEL PLATA

The rich estanciero or the prosperous business man of Buenos Aires likes to spend his money at Mar del Plata, a resort which for fashion rivals Newport in Rhode Island, Viña del Mar in Chile and Cannes on the Riviera, while in magnificence it outshines them all. Behind the columns of the Rambla—the great stone esplanade—are rows of fine shops.

PLAYA POCITOS ON THE SOUTH AMERICAN RIVIERA

Uruguay has several fine resorts east of Montevideo, on the Atlantic shore. This shows the beach at Playa Pocitos, with its trampled, gleaming sand, its gay umbrellas and its white beach tents. Argentineans as well as Uruguayans come to this part of the coast for vacations and week-ends, and many prefer it to the more expensive Mar del Plata.

region of northern Argentina. On the right, between the Uruguay River and the Paraná, lies the rich province of Entre Ríos. The soil here is very fertile, and the grain grows high. On the left stretch more farmlands, and this would be a veritable farmer's paradise were it not for the terrible swarms of locusts which appear at intervals out of the north and consume every growing thing in their path. Rosario, the centre of this farming country, is the second city of the republic. Around it lie miles of the best wheat lands, and the converging railways bring in corn, wheat and linseed to be loaded into ocean steamers and shipped down the river to Europe and other far-away places. Northwest of Rosario is Córdoba in an outlying range of the Andes. The oldest university in Argentina was founded here in 1613, and the pleasant old city is a centre of Spanish culture.

We do not usually think of sugar in connection with the Argentine, but Tucumán, in the foothills beyond Córdoba, is far enough north to have a semi-tropical climate. Both sugar and tobacco grow in this vicinity; the plantations are irrigated by water from the hills and in good years the cane crop is large enough to supply sugar for the whole republic.

Not far from here we pass out of the farming country into the Gran Chaco, a wooded wilderness stretching clear across northeastern Argentina and half of Paraguay into lower Bolivia and Brazil. The Chaco is tropical and much of it is unexplored, but it has fine timber and rich soil. Many workers search its tropical forests for the valuable quebracho tree. Quebracho wood is exceedingly hard and durable; it resists insect attacks and withstands rot even under water, which has a petrifying effect upon it. Consequently it is much used for railroad ties throughout the Argentine. The word means "ax-breaker," and indeed the wood is hard enough to injure ordinary tools. Quebracho extract is made in large quantities from the bark, roots and logs, and used in tanning leather.

The Pilcomayo River divides the Argentine Chaco from the Paraguayan, and both

G. Bourquin and Co.

POWER AND LIGHT FOR CÓRDOBA

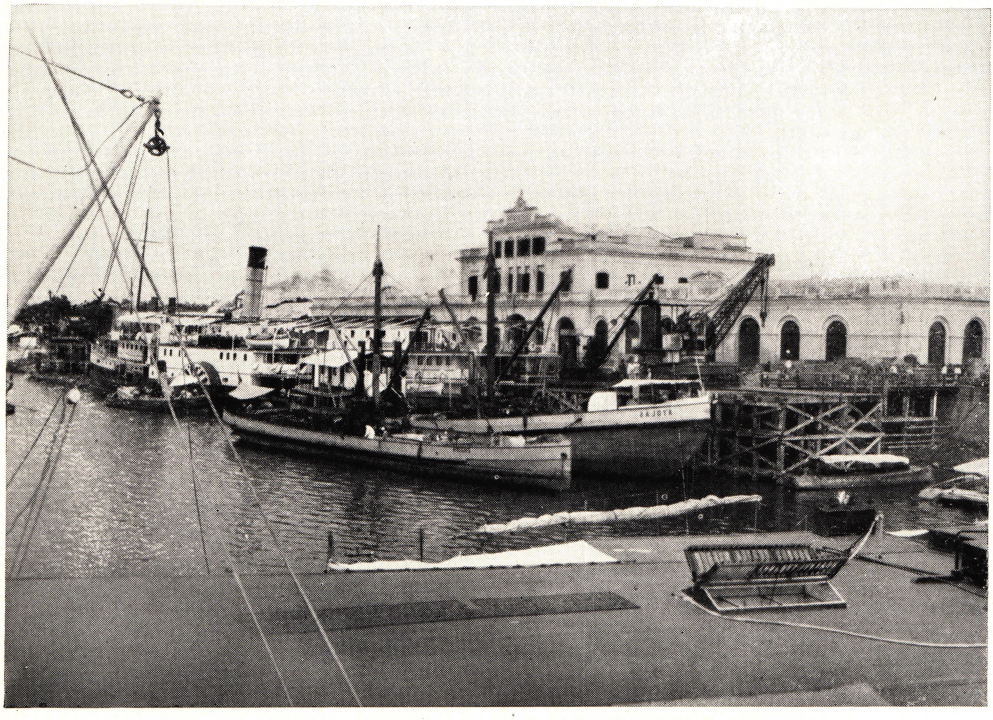
In some parts of northern Argentina there are high, barren plateaus, desolate marshes and salt beds, but around Córdoba the scenery is quite lovely. This is the lake and dam of San Roque.

Paraguay and Bolivia claim much of the Chaco Boreal, which is the triangular territory between the Pilcomayo and the Paraguay rivers. So little is really known of the region that one hears all sorts of strange stories about the queer birds, animals, snakes and Indians who live there. A fish which is not legendary but all too real is the piraña; though small, it is very ferocious, and will attack anything in the water, tearing with its wickedly sharp teeth at the flesh of animals or men indiscriminately. The Indians call it the man-killer, and fear it like an alligator. The Chaco Boreal will not always be a jungle wilderness full of fabulous animals because gradually pioneers from Paraguay proper and from abroad are pushing in to develop the territory.

The rest of Paraguay lies between the Paraguay River and the Alto (Upper) Paraná. Shut in on all sides by big and powerful neighbors, the little nation seems very far away and isolated. Its history has been stormy ever since sixteenth-century days when the Jesuits tried to protect the Indians, establishing missions which were attacked and finally destroyed

RED-TILED ROOFS AND PATIOS OF ASUNCIÓN

The capital of Paraguay looks out over the sluggish, winding Paraguay River to the plains of the Chaco wilderness beyond. The houses are built patio-style and painted in bright colors —pink, yellow, red or blue. The building with the tower, at the extreme left, was built by the dictator Francisco López, and is now the government palace.



PARAGUAY'S PORT OF ENTRY

River vessels large and small crowd each other for space at the custom-house dock in Asunción. For centuries the Paraná and its tributary, the Paraguay, were the only line of communication with the rest of the world, and the rivers are still vitally important, but now a railroad connects Asunción with Buenos Aires and there is air service between the cities.

Boulter

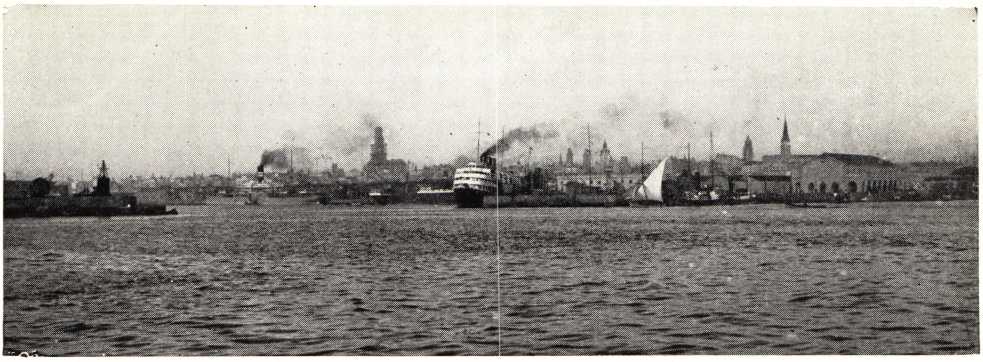
COWBOY WITH THE SKIN OF A DANGEROUS CATTLE-SLAYER

The rolling grasslands of Paraguay afford excellent pasture for great herds of cattle, which, however, are often attacked by jaguars. These great, leopard-like beasts do great damage, so that ranchers and cowboys hunt them down without mercy. This sturdy horseman has just killed a big specimen with a magnificently marked skin.

by the Spanish settlers and the Portuguese of neighboring Brazil. Three years after Paraguay became independent in 1811, a strange and remarkable man made himself dictator. This was Dr. Francia, who had been active in securing independence. Until 1840 his word was the only law in Paraguay and he tried to cut the country off from all contact with the world outside. Foreigners who entered were sometimes forced to stay for years. Every detail of living was strictly regulated by the dictator. He lived in seclusion and was scarcely ever seen, but his power was felt and feared by everyone. After his death two other dictators succeeded him —Carlos Antonio López, and the latter's son, Francisco. The younger López was exceedingly arbitrary and high-handed, interfering in Uruguay's politics, and provoking trouble with Argentina and Brazil. All three of those countries combined against him in the War of the Triple Alliance (1865-70), a conflict which left Paraguay in terrible desolation. Three-quarters of her people were dead from wounds, disease and starvation, and of the less than three hundred thousand remaining, there were four women to every man. Cities and towns were in ruins, crops were not planted, farms were overgrown, cattle and horses were killed for

GAUCHOS SEPARATING A HUGE HERD OF CATTLE IN THE CAMPANA, URUGUAY

Uruguay's prosperity lies in the cattle and sheep that are raised on its grass-covered plains. As in Argentina, the herds are watched by picturesque gauchos, somewhat fierce-looking with their heavy cattle whips, riding-boots and long ponchos, often of white wool. Dried beef, corned beef, ox-tongues, canned and frozen meat are all products of these stock farms. Leather is made from the hides; horns and hoofs produce glue, and fertilizers are obtained from the bones and waste meat. Animals and animal products constitute about 95% of the exports of Uruguay.



GETTING UP STEAM IN THE PORT OF MONTEVIDEO

Looking across the great harbor at Montevideo we see not only the shipping in this busy port but the city's crowded business district as well, with a new building under construction. The port is filled with vessels of all sorts, from the big freighters at dock and the ocean liner getting up steam, to tugs, motor-boats and little fishing-smacks with graceful sails.

food or ran wild. From this disaster Paraguay has been slowly recovering ever since, though often hampered by weak government.

The loss of population and property have made it poor in spite of its rich natural resources. Entering from the Argentine, the countryside seems relatively uninhabited. The farms are few and far between. The horses and cattle are not so fine, because stock-farmers have not been able to import many valuable pedigreed animals to improve the run-down stock. Yet the pasture lands are well watered, and the reddish soil remarkably rich. We see orange trees growing everywhere, without cultivation. The first ones were planted by Jesuit missionaries, long ago, and the fruit is very fine—big, juicy and sweet. It is collected by the cartload at every little thatched village on the Paraguay River, and lies in great shining yellow heaps until it is loaded on shipboard and sent off down to Buenos Aires.

Life in Paraguay is neither hurried nor over-complicated. The poorer people live in thatched huts with earthen floors and little furniture. They cook their meat and vegetables and prepare their yerba maté over an open fire under the porch roof. A drink of maté takes the place of breakfast and nobody eats any solid food until later in the day. The large farms have roomy one-story houses surrounded by wide shady porches; their red tiled roofs gleam among the green orange groves and often a tall iron windmill towers above the surrounding pasture-lands.

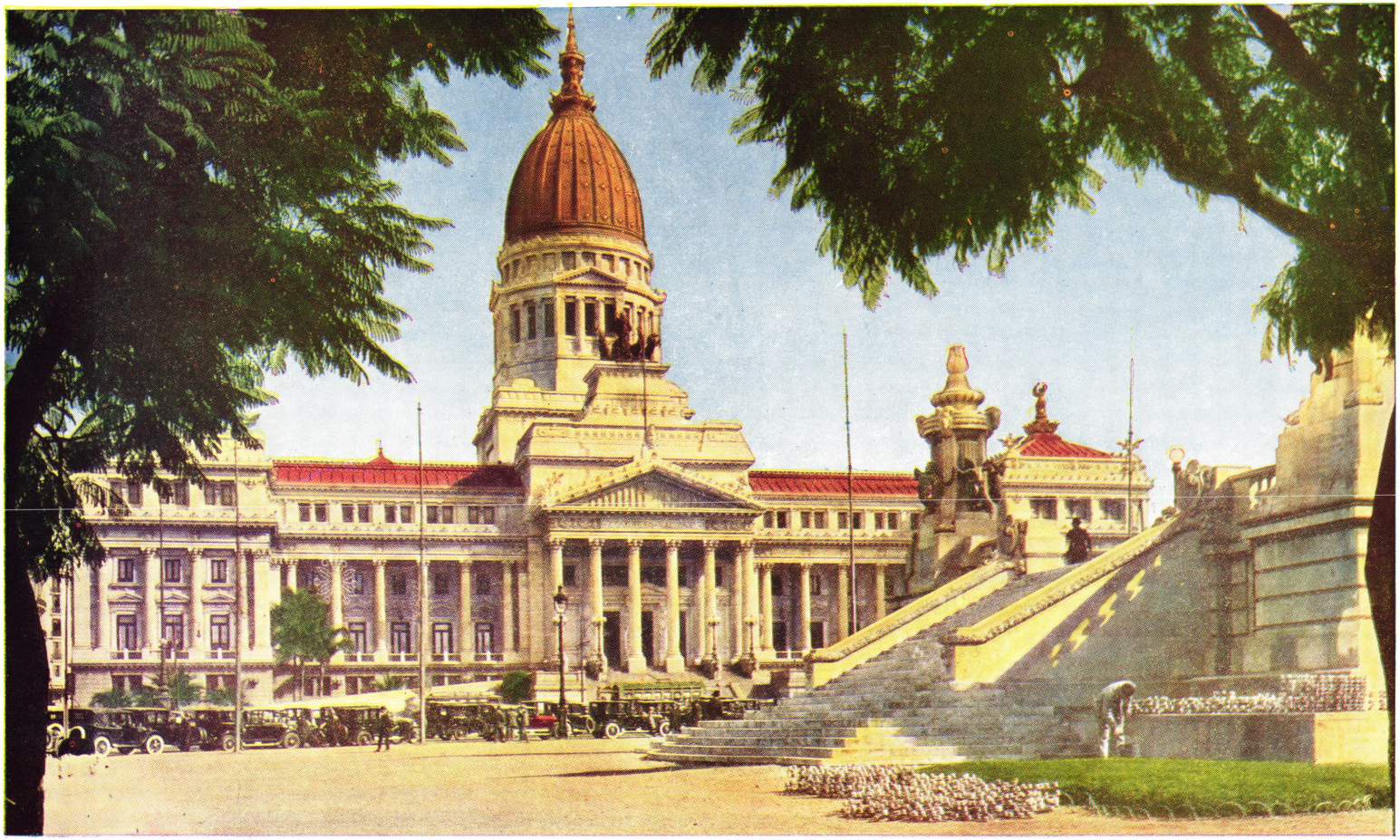
In the country small children run about without any clothes on their brown little bodies. Most Paraguayans have both Guaraní Indian and Spanish blood in them, which accounts for the darkness of their complexions, and the fact that Guaraní is spoken as frequently as Spanish. The women have the habit of carrying all bundles on their heads, which gives them a very erect, graceful walk. On a country road or in the market at Asunción alike, we may meet a girl balancing on her head a basket of oranges, a bundle of sticks, a jar of wine or a side of fresh-cut beef. She never steadies the load with her hands —they are free to hold a baby or light a cigar. Everybody smokes the home-grown tobacco, which is popular in Argentina and Uruguay as well.

Paraguayan women make very beautiful lace of a cobweb pattern called ñandutí. Rich and poor alike wear shawls of the filmy stuff, and the market women trim their bright blouses with it. Well-to-do ladies prefer Parisian styles, which are to be seen in the finer streets of Asunción and at San Bernardino, the fashionable resort on Lake Ipacarai. When the weather in July and August grows too unpleasantly cool, wealthy people from Buenos Aires pack up and move to San Bernardino for a few weeks.

Asunción is the only large city in the country. Like many Latin-American towns, it strikingly mingles the old and

DECOU FROM EWING GALLOWAY

THE SPANISH MONUMENT in Buenos Aires was generously given to the Argentine nation by Spain at the centennial celebration of Argentina's independence from Spanish rule. It stands in Palermo Park, not far from the great Hippodrome track where all Buenos Aires congregates to watch the big horse races held by the famous Jockey Club.



DECOU FROM EWING GALLOWAY

THE PALACE OF CONGRESS at Buenos Aires is one of the show places in a city of splendid buildings. It faces the Plaza del Congreso, at one end of the Avenida de Mayo, and its graceful dome is visible far down the Avenida. This view from between the trees at one side of the Plaza shows the steps of another great monument to Argentine independence, and the workman is getting ready to hang up electric lights for some celebration. Judging from the number of parked cars, Congress was in session when the photograph was taken.

the new. Most of the streets are rough with great cobblestones, over which ox-carts jolt and donkeys pick their way. But automobiles appear in greater and greater numbers, and electric car lines criss-cross the city.

Little Uruguay, the smallest republic in South America, has been described as a "lovable" land, with pleasant hills, valleys, rivers, woods and undulating grassy country, and a climate never too hot or too cold. From the fact that it lies east of the Río de la Plata it was formerly called the Banda Oriental, or East Bank, and even now the people call themselves "Orientales."

Spaniards and Portuguese fought each other for it, and the Charrúa Indians, fierce and implacable, fought both and destroyed their settlements. Brazil and Argentina were each determined that the other should not have Uruguay, and consequently it was able to make good its independence in 1828. In spite of its small compact shape and homogeneous population, it was for many years troubled by disputes between two political parties, the Blancos and the Colorados (Whites and Reds). Now, however, the country is one of the most orderly and progressive in South America. The schools are very up-to-date, and so are the various government departments, while the government has been making interesting experiments in state socialism.

As we cross the one hundred and twenty miles of muddy water which separates the Uruguayan capital from Buenos

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BOYS BELONGING TO MONTEVIDEO'S BOOTBLACK BRIGADE

In Montevideo, as in Buenos Aires, we are invited every few yards to have our shoes cleaned, and the itinerant bootblacks do a good business, for the people are particular to have every detail of their clothing just right. One sees, proportionately, more well-dressed people in Montevideo and Buenos Aires than in most other large cities.

© E. N. A.

MONTEVIDEO, URUGUAY'S SPLENDID CAPITAL BY THE RÍO DE LA PLATA

The older streets of Montevideo are very narrow and quite different from the broad, well-paved boulevards in the modern section. Avenida 18 de Julio is named for the day on which Uruguay became a republic; it is one of the finest streets in the city, containing many theatres and shops. The druggists' shops are noticeable everywhere, and idlers use them as clubs.

Aires, the most noticeable object is the Cerro, the only hill on the flat banks of the Plata. As the Portuguese explorer, Magellan, sailed up the estuary, the sailor in the ship's lookout was quick to notice the Cerro and called out "Monte video," which means "I see a mountain." This became the name of the city which has grown up almost at its foot.

Montevideo is situated on a peninsula, just where the muddy Plata joins the blue Atlantic. On the river side is the great horseshoe harbor, always filled with shipping; on the ocean side golden sands stretch for miles along the coast. This is the Riviera of South America, which during the summer is thronged with wealthy visitors escaping from city heat.

Uruguayans pride themselves on being more purely Spanish than other South Americans. In the grilles over the windows and in the general appearance of the beautiful houses along the older streets of the capital, we are constantly reminded of old Spain. Yet Montevideo is only less modern than Buenos Aires, and in a way it is more lovely. The parks and plazas are many and beautiful. So ideal is the climate that flowers of both tropical and temperate lands flourish alike. The Prado, the Parque Urbano and the botanical garden overflow with orchids as well as roses; one sees tall Lombardy poplars growing by ivy-covered buildings, while the driveway along a near-by stream may be lined with palms. It is small wonder that Europeans and North Americans often count Montevideo the most delightful city in South America.

Leaving the pleasant capital behind, we enter the grassy, undulating Campana where graze the cattle and sheep that form the country's greatest asset. Away from the railways and the towns, everybody seems to ride, whether it be the priest going to service, the gaucho or postman at his daily work, or a laughing group of boys and girls coming into town to school. The farmhouses range from spacious and comfortable modern mansions to simple, wooden shacks and humble thatched erections of turf. As in the Argentine, a few

PHOTOGRAPHS FROM EWING GALLOWAY

FIELD HOCKEY as the Lengua Indians play it is a vigorous, rough-and-tumble game, and their dances are almost as animated. This tribe and many others hunt and fish in the Paraguayan Chaco; occasionally they work in lumber camps or on sugar plantations, but they never stay long, and go back to their savage life as soon as they are paid.

EWING GALLOWAY

BETWEEN ARGENTINA AND BRAZIL are the mighty falls of the Río Iguazú, which rival Niagara and the Victoria Falls in size and grandeur. In the dry season, there are about twenty separate cascades, besides a double crescent-shaped fall eight hundred yards wide on the Argentine side and a similar one near the Brazilian bank. At high water the river swells enormously and a torrent more than two miles wide rushes over the rock ledges in two great drops, totally obliterating most of the islets which divide the falls at low water.

individuals own most of the land, although wider distribution would benefit a majority of the people. But unlike the capital, the Campana is conservative and changes come more slowly here.

The banks of the border river, the Uruguay, are studded with the white roofs of "frigoríficos," or meat refrigerating plants. At Fray Bentos fifteen hundred people are kept busy making beef extract. Paysandú, higher up the river, is famous for its frozen and canned meats. Although Uruguay's commercial life depends on meat and wool, there are a few other industries. Not far from Montevideo are ostrich farms where the rhea is shorn of its fine feathers, and at Maldonado the boats bring in sealskins from the islands. But like its great neighbor, Uruguay is first and foremost a cattle and sheep country. And if it be neither so vast nor so enormously rich as Argentina, it is restful as well as progressive and big enough and rich enough for comfort.

ARGENTINA, URUGUAY AND PARAGUAY: FACTS AND FIGURES

ARGENTINA (República Argentina)

Bounded north by Bolivia and Paraguay, east by Paraguay, Brazil, Uruguay and the Atlantic, west by Chile and south by Chile and the Atlantic. Area, 1,153,119; population (1930 estimate), 11,192,702. Legislative authority vested in National Congress consisting of Senate (30 members) and House of Deputies (158 members); President is elected for 6 years through an electoral college appointed by the 14 provinces and the capital. Provinces have their own legislatures and elect their own governors. No state religion, though Roman Catholicism is supported by the state; all other creeds tolerated. Education free and compulsory between ages of 6 and 14; 10,840 primary schools with 49,212 teachers and 1,349,648 pupils in attendance (1929); numerous secondary, private and special schools; 5 national universities, 2 provincial universities and 2 well-equipped national observatories.

Country essentially agricultural and pastoral, producing wheat, corn, oats, barley, linseed, lucerne, cotton, sugar-cane, rice, potatoes, tobacco, grapes and peanuts. Meat refrigeration and flour-milling are important industries. Mining relatively unimportant although gold, silver, copper, tin, coal and petroleum are found. Chief exports: corn, wheat, oats, linseed, wool, chilled and frozen beef and mutton, sheepskins, quebracho extract. Imports: textiles, iron and steel goods, foodstuffs, glassware, crockery, oils. Railway mileage, 23,795, mostly privately-owned; telegraph wire mileage, 203,502; telephone wire mileage, 795,724; 12 wireless stations. Mail and passenger air service has developed rapidly. Chief cities: Buenos Aires (capital), population, 2,116,284; Rosario, 410,000; Córdoba, 239,600; La Plata, 165,813; Tucumán, 91,216; Santa Fé, 59,574; Mendoza, 58,790; Bahía Blanca, 44,143.

PARAGUAY (República del Paraguay)

Bounded north by Bolivia and Brazil, east by Brazil and Argentina, south by Argentina, west by Argentina and Bolivia. Area, about 61,647, not including the territory known as the Chaco Boreal (about 100,000 square miles) claimed by Bolivia and Paraguay; estimated population, 843,905. Legislative power vested in Congress of 2 houses—a Senate (20 members) and a Chamber of Deputies (40 members); executive power in a President elected for 4 years, and a Cabinet of 5 ministers. Roman Catholicism the established religion, but others are tolerated. Education free and nominally compulsory; 1 university.

Tobacco, sugar, rice, sweet potatoes, ground nuts, corn and cotton are grown, but agriculture is primitive. Cattle number about 4,000,000 head. Iron, manganese copper and other minerals abundant. Chief exports: hides, yerba maté (Paraguayan tea), oranges, mandarines, tobacco, meat extract, quebracho logs, canned and preserved meat. Imports: cotton textiles, flour, wheat. Railway mileage, 659, about half British-owned; telegraph line mileage, 1,200; 3 wireless stations. Chief towns: Asunción (the capital), population, 142,300; Villa Rica, 26,000; Luque, 13,000; Carapegua, 12,000; Concepción, 11,000.

URUGUAY (República Oriental del Uruguay)

Bounded north and east by Brazil, south by the Atlantic and the Río de la Plata and west by Argentina. Area, 72,153; population, 2,036,884. Legislative authority in hands of a Senate (19 members) and Chamber of Representatives (124 members), which form a parliament; executive power exercised by the President and National Administrative Council of 9 members. Complete religious liberty, though majority are Roman Catholics. Primary education obligatory; 1,527 schools with 4,888 teachers and 174,952 pupils (1929); the university at Montevideo has 11,000 students.

About 60% of total area devoted to stock-raising. Agricultural products: wheat, corn, linseed, oats, grapes, tobacco, olives. Gold is worked and silver, copper, lead, manganese and lignite coal are found. Exports: live animals, meat and extracts, wool, sheepskins, hides. Imports: cotton textiles, iron and steel manufactures, coal. Railway mileage, 1,729; telegraph wire mileage, 6,530; telephone wire mileage, 68,572. Chief towns: Montevideo (the capital), population, 468,634; Salto, 30,000; Paysandú, 26,000; Mercedes, 23,000.

THE EMPIRE WE CALL BRAZIL

The Giant of the South American Continent

The territory of the United States of Brazil occupies nearly half of the South American continent, and contains one of the least explored regions of the world—the basin of the Amazon. Forests, inhabited by unknown tribes of Indians cover thousands of square miles in the valleys of the Amazon and its tributaries. Yet Brazil contains such modern and populous cities as Rio de Janeiro, Santos, São Paulo, Bahia and Recife, so that the traveler can pass in a few days from scenes of absolute savagery to teeming boulevards that recall Paris, Lisbon and many another European city. The country is so vast and its resources—from coffee plantations and rubber forests to diamond mines—so varied, that each section is an empire in itself.

BRAZIL is one of the giant nations of the world. It is larger than the whole continent of Australia, and only Russia, China, Canada and the United States with Alaska surpass it in size. It is thus a country of magnificent distances, and boasts the world's largest river—the Amazon—which flows through an immense, mysterious, jungle-covered territory. This tropical region has given men a variety of valuable products, from rubber to drugs. The state of São Paulo, on the other hand, keeps half the world supplied with coffee, and the southernmost part of the country is so far from the Equator and the Amazon that it has a temperate climate like that of Uruguay. It was the daring and endurance of adventurous Portuguese colonists which resulted in the opening up and expansion of such a vast and varied territory, and beautiful Rio de Janeiro is the largest Portuguese-speaking city in the world. European settlers still come by the thousand, to help in the development of the land. Consequently, as a nation Brazil is still in the making.

In the sixteenth century Brazil was known to the Portuguese as the land "where the wood came from," since their sea captains brought back from there large quantities of the highly prized "bresil" wood, used in making red and purple dyes. In time that name displaced all the more dignified ones bestowed on the new country, and so we know it as Brazil.

A few months before Pedro Alvares Cabral came to anchor off the coast of Bahia in 1500 and took possession of the country in the name of the King of Portugal, a Spanish explorer, Vicente Pinzon, had skirted part of the coast and entered the Amazon. Later another Portuguese, sailing south of Bahia, entered a beautiful bay which he thought was the estuary of a large river. Since this occurred on New Year's Day he named the non-existent river Rio de Janeiro (River of January), and in so doing supplied the name for what is now the capital city of Brazil.

Gradually, here and there, usually at the mouths of the rivers, small settlements of Portuguese and Indians were formed, but the English, Dutch, French and Spaniards likewise endeavored to obtain a share of this new country. The Portuguese, taking alarm, began to colonize Brazil in earnest, and after two centuries of struggle drove out all other white races, but the Dutch, at least, left a permanent impression behind them.

The coastal settlements grew into small cities and portions of the land were cleared and planted with sugar and tobacco. The gold and precious stones brought in by trading Indians caused the more adventurous settlers to push farther inland. Always in advance were the Jesuits, who founded São Paulo in the highlands back of the Serra do Mar and then pushed on into the country of the Paraná, toward Paraguay. There they founded missions, converted the Indian tribes and taught them to raise crops and spin cloth. But the men of São Paulo—

EWING GALLOWAY

THIS BORORO INDIAN has a good eye and strong muscles, or he could not handle his big hardwood bow and its unusually long feather-tipped arrows. He has tied a couple of bright feathers in his hair, and the charm hanging from his neck is also featherwork. The Bororo tribe lives in the Amazon wilderness near a stream which was long called the River of Doubt, as its true course was in doubt long after its existence was rumored. In 1914 Theodore Roosevelt and the Brazilian General Rondon mapped its course, and now it is called the Río Roosevelt.

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ACROSS BOTAFOGO BAY, a semicircular sweep of calm water which is part of the great Bay of Rio de Janeiro, are the white walls and flat red roofs of Botafogo, a southern suburb of the city, and beyond them again towers the sheer point of Corcovado above the gentler slopes of many other heights. The Avenida Beira Mar, beautifully planted and lined with trees, skirts the shore of Rio's harbor for over four miles, and at night, when thousands of lights are reflected in the water, the loveliness of this scene is almost unbelievable.

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THE HANDSOME LUZ STATION SERVES PROSPEROUS SÃO PAULO

São Paulo is the third largest city in South America and the metropolis of the coffee-growing district of southern Brazil. Many of its fine houses are the homes of wealthy planters. It is a most attractive city, with palatial public buildings, and numbers of beautiful parks where plants of the tropics and the temperate zone grow side by side.

the Paulistas—wanted slaves for their plantations and hated the Jesuits for protecting and helping the Indians. So the Paulistas organized raids called "bandeiras" in order to destroy the missions and carry the Indians back as slaves. The men who went on the bandeiras were ruthless and indomitable; often an expedition lasted for years and many men never came back. The survivors not only drove out the Jesuits but explored, acquired for Brazil, and began to settle all the vast interior covered by Matto Grosso, Minas Geraes and Goyaz.

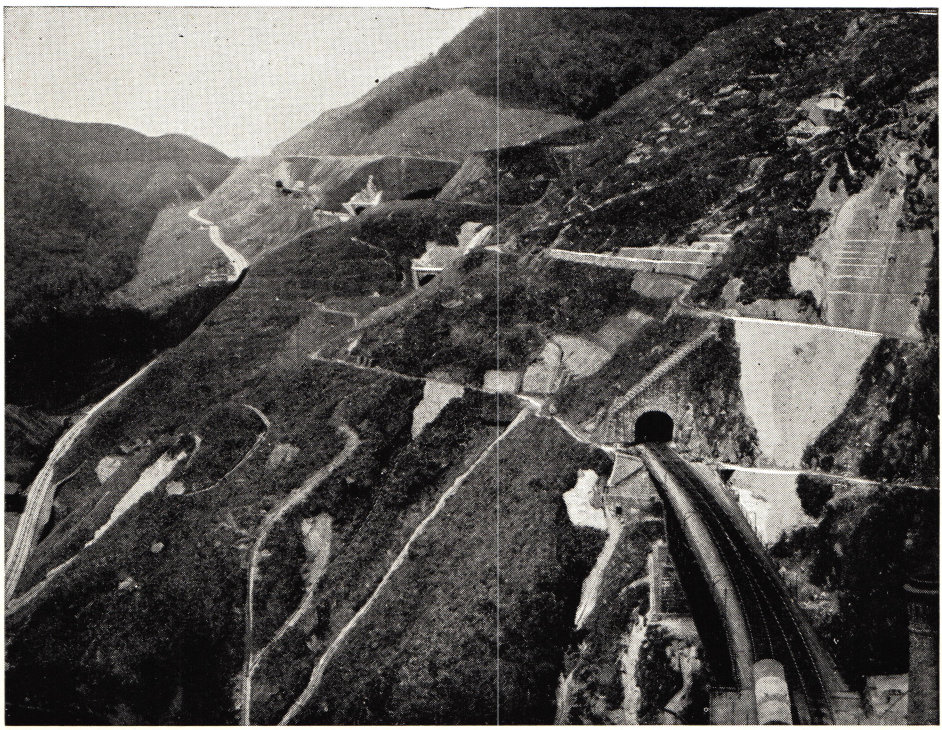
In time the enslavement of Indians was forbidden and Negro slaves were imported from Africa to work the coastal plantations which were owned by aristocratic families from Portugal. So important did the colony become that when Napoleon invaded Portugal, King John VI and his court sailed to Brazil and made Rio de Janeiro the seat of government of the Portuguese Empire. In 1822, after the king had gone home, leaving his son Dom Pedro as regent, Brazil became an independent empire under the prince, who ruled as Pedro I until 1831. In that year he abdicated in favor of his six-year old son. When Dom Pedro II grew up he proved a wise and good ruler, and did much for the development of Brazil. But many people came to believe that a republican government would be more desirable, and in 1889 a revolt at Rio de Janeiro led to the formation of a federal republic, and that is the present form of government.

The Amazon jungle covers all the northern and central part of Brazil, and the huge river itself runs from west to east, from the Andes to the Atlantic. Near its mouth and almost on the Equator is Pará, an important seaport the name of which is synonymous with rubber, and from there the coast stretches away to the great eastern shoulder of the continent, where South America is nearest Africa. Recife, or Pernambuco, is the easternmost of Brazil's large cities. All the coastal region south of it is separated from the Amazon basin by several low mountain ranges, through which the São Francisco River breaks its way to the sea, while at Rio de Janeiro the hills come right down to the water, forming the marvelous harbor. Behind these mountains of eastern Brazil lie the tablelands

which divide the Amazon watershed from that of the Paraná and which are a most important part of the country. Until comparatively recent times, civilization touched only the fringes of the vast territory, and still the bulk of the people live along the coast and in the more accessible provinces of the east and south.

The total population is less than that of tiny England and is very mixed. The descendants of the old aristocratic landowners are pure Portuguese, but usually the early settlers—Portuguese, English, Dutch or French—married Indians, and their descendants intermarried with one another and with the Negroes imported originally as slaves, so that the Brazilians are developing into a distinct racial type as a result of this long fusion. In later years many Germans, Italians and Spaniards—as well as Portuguese—have come as settlers and added to the racial mixture. These more recent colonists usually go to the southern states where the climate is not tropical.

Rio Grande do Sul is the southernmost state of Brazil, and no more like the northern states along the Equator than Uruguay is like Ecuador. It resembles Uruguay in its pleasant climate and in the rolling nature of the country, which is equally suitable for pasture or the growing of every crop of wheat and beans to coffee and tobacco or sugar and oranges. Many of the farmers are Germans, and it is a common experience to see towheaded youngsters helping with the work and hear German speech—so unlike the flexible Portuguese—on the streets of the cities. In Santa Catharina, the next state to the north, there are so many Germans that one section has been nicknamed "West Deutschland." These settlers are good farmers and hard workers.



L. E. Elliott

COFFEE SHIPMENTS PAY FOR THE COSTLY SÃO PAULO RAILWAY

The line between Santos and São Paulo was very difficult and expensive to build, for it climbs nearly three thousand feet in six miles. Cars are pulled up the heavy grades by cables attached to stationary engines, and in the steepest parts there are but three rails, so that up and down trains must turn out for each other.

BARCLAY

RIO DE JANEIRO is in the eyes of many people the most beautiful city in the world. It is built in the hollows between many rugged, curiously-shaped hills. One of the most majestic is rocky Gavea, and here from this promontory crowned with palms we have a view of it across a blue lagoon in the southwestern outskirts of the capital.

ELLIOTT

FROM MT. SANTA THEREZA we look through the trees and out over one of Rio's delightful valleys to the Sugar Loaf, the cone of rock over 1,200 feet high that stands like a sentinel at the harbor mouth. The splendid bay is so large that early explorers thought it the estuary of a great river, which they named River of January—Rio de Janeiro.

R. M. S. P.

THE GREAT HARBOR OF SANTOS, WHERE COFFEE GOES OUT AND IMMIGRANTS COME IN

Santos is the chief port of Brazil, outranking even Rio de Janeiro in quantity of goods handled, for all the coffee grown in the state of São Paulo is shipped from here, and that means many millions of sacks every year. First the beans have to be cleaned, sorted and graded; then tasters judge the flavor of cupfuls made from samples of each grade. The huge warehouses down by the docks are filled with bags awaiting shipment; the bulky sacks weigh 132 pounds each and are carried on board ship by husky porters or by endless belt conveyors.

Paraná, the next state to which we come on the railway line from Uruguay, stretches from the ocean to the Paraná River which here serves as the boundary between Brazil and Paraguay. The state is similar to Paraguay in some ways; it has the same warm sub-tropical climate, and the same forests where yerba leaves and valuable timber are to be found.

São Paulo, between Paraná and Rio de Janeiro, is the most energetic, populous and wealthy state in Brazil, the one which has made Brazilian coffee famous. In colonial days, when the capital was at Bahia in the north, the men of São Paulo managed their own affairs and built up their community without much help or interference from the central government. The state has always been a leader in agricultural and industrial development. Its two large cities are Santos and the capital, São Paulo. Santos is the gateway of the state, the port through which coffee goes out and other merchandise comes in. Into it pours a steady stream of immigrants seeking work on the coffee plantations of the interior or going south to the farms and cattle ranches of Paraná and Rio Grande do Sul.

At least half if not two-thirds of the coffee of the world is exported from tropical Santos. The beans are grown on the highlands back of the Serra do Mar, the mountain range which rises behind the port. The fine city of São Paulo and all the big coffee estates, or "fazendas," are on this high plateau. The aristocratic landed proprietors—the "fazendeiros"—live in large rambling houses on vast plantations, some of which cover seventy-five or a hundred thousand acres.

In September when the coffee trees are

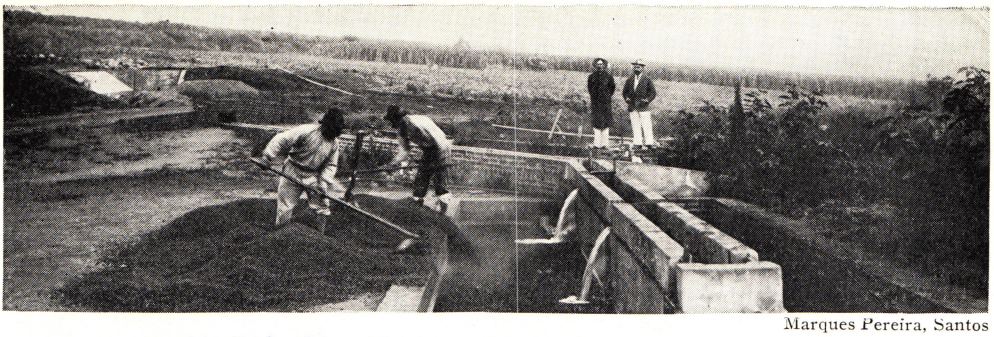
COFFEE IS NOT THE ONLY PRODUCT SHIPPED FROM SANTOS

The low tropical coast of São Paulo is well suited to banana-raising, and every year sees more bunches exported from Santos to Uruguay, Argentina and Europe, although the number does not compare with Colombian and Central American production. The sections, or "hands" of the Brazilian bunch are smaller than those of some varieties, but the "fingers" are quite thick.

Photographs from Gaensly, S. Paulo

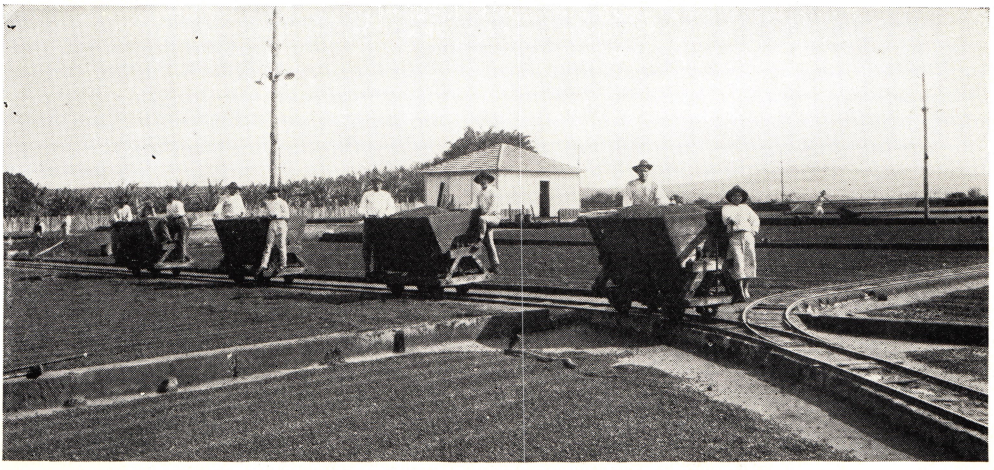
NOTHING BUT COFFEE TREES AS FAR AS EYE CAN SEE ON A SÃO PAULO FAZENDA

In São Paulo the coffee estates, or fazendas, stretch for mile on mile over the rolling hills, and wherever we look we see rows of green bushes planted in the rich brick-red soil. The Fazenda Guatapará, where this view was taken, has nearly two million coffee trees and employs four thousand laborers. From late April to June is the harvest season, when every man, woman and child turns out to help pick the pulpy red berries. The larger a man's family, the greater the number of trees for which he is responsible. The inset shows pickers at work on another fazenda.

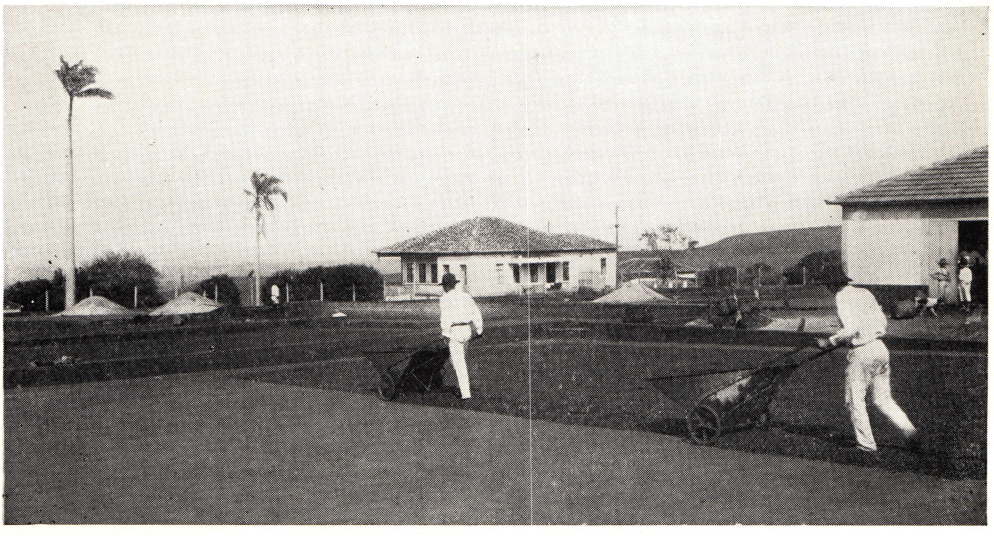


Marques Pereira, Santos

WASHING COFFEE BEANS TO REMOVE THE PULP



ON A BIG FAZENDA THE DRYING PLATFORMS COVER ACRES



SPREADING THE BEANS TO DRY UNDER THE HOT BRAZILIAN SUN

Each coffee berry contains two oval seeds, or beans, and to extract these the berries must be carefully crushed. Then the pulp is washed off, as we see in the top picture, and carloads of wet beans are distributed to the drying platforms. There they are spread out every morning and raked up and covered to protect them from the dew at night.

© E. N. A.

THIS BRAZILIAN PEDDLER KNOWS HOW TO PACK HIS LOAD

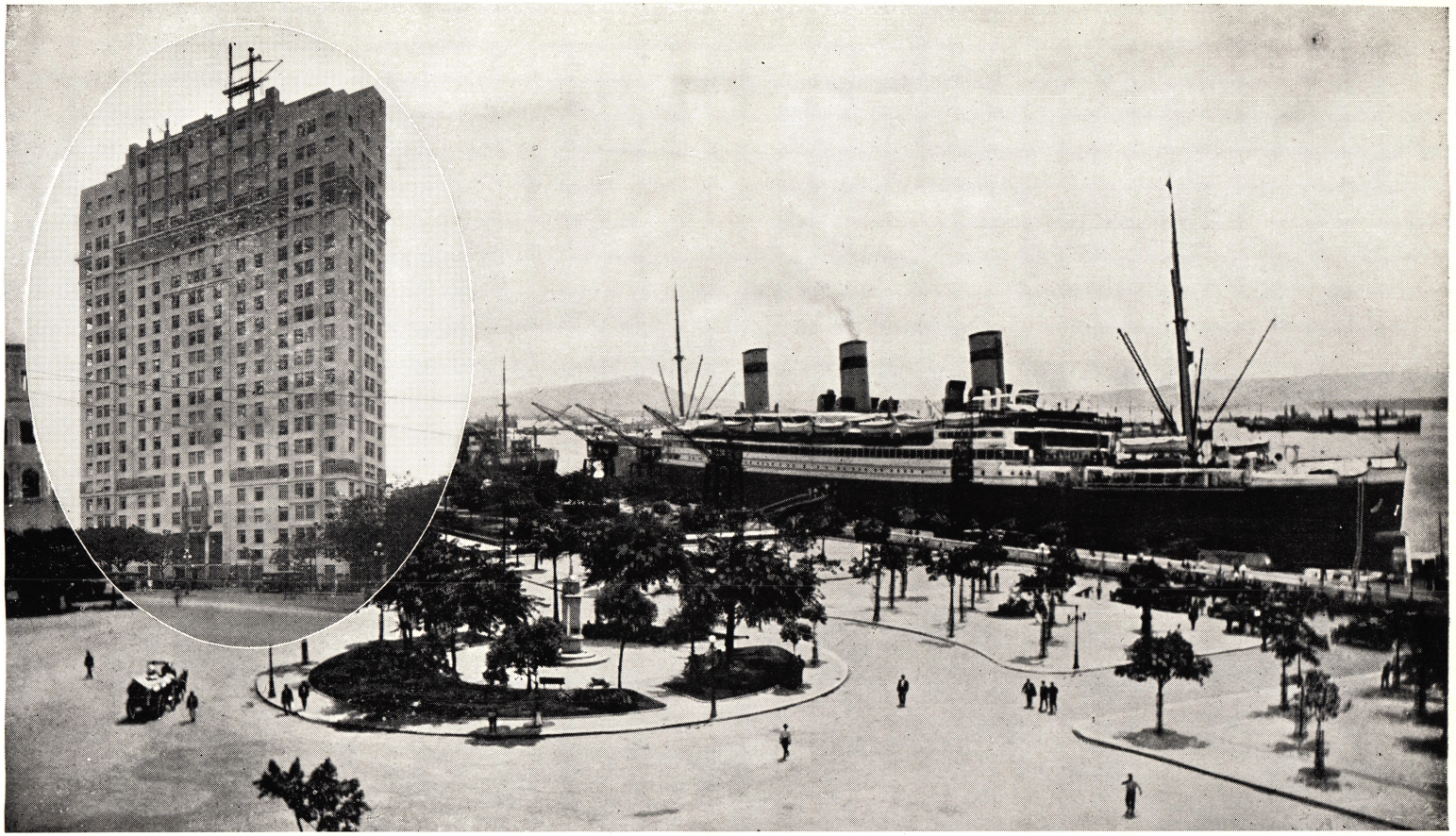
"Brushes and brooms and feather dusters, and a wicker chair for the baby"—that is what this man would be saying if he spoke English, but as he is one of the many peddlers who walk the streets of Rio de Janeiro, he cries his wares in musical Portuguese. The feathers for the dusters come from the rhea, the South American ostrich.

in blossom the whole country is covered with a fragrant mantle of filmy white. Until the crop is harvested and packed off to Santos the fazendas are hives of industry. After that the fazendeiros and their families usually take a holiday in some gay city—Rio de Janeiro, Buenos Aires, Montevideo—or perhaps Paris.

But Europe's finest cities cannot surpass Rio de Janeiro in beauty of setting. "Rio" has one of the finest locations in the world, on the shores of a superb bay with mountains all about and steep hills jutting up between different parts of the city itself. At the very entrance to the bay is a high conical mountain of rock called the Sugar Loaf; an aerial railway swings a car along over the tree tops to the summit, and from there we may gaze out over the splendid city. The red roofs of its houses show up against the green foliage of trees and parks, below a skyline jagged with rocky mountain-peaks; in front, directly beneath, are the curving and deeply indented shores of the bay, where islands break the blue surface, and at our backs is the ocean. Nowhere else in all the world is there such a panorama.

THE SPLENDID PALM TREES OF THE RUA PAYSANDU IN RIO

Originally there were no royal palms in Brazil, although other varieties of palm are native to the country. A little over a century ago, some seeds of the royal palm were brought from abroad and planted in the Botanical Gardens; the tree which grew from those seeds is still alive, and is the mother of all the tall, graceful palms which line Rio's streets to-day.



WHERE THE GREAT LINERS DISCHARGE PASSENGERS AND CARGO IN RIO'S SHELTERED HARBOR

It is hard to realize that Rio was once avoided by travelers and feared by sea captains. Malaria was chronic and frightful epidemics of yellow fever occurred periodically. But in 1903 and 1904 the city was made thoroughly sanitary and much of it was rebuilt. Whole blocks of houses were torn down to make room for the Avenida Rio Branco and new docks and warehouses were built. Beside the liner we see three of the electric cranes which handle cargo. The new 23-story building in the inset houses the newspaper *A Noite* and faces this square, the Praça Maua.

THE MONROE PALACE IS BRAZIL'S NATIONAL CAPITOL

The National Senate of Brazil does its work in the great white building which was originally erected to house the Brazilian exhibit at the St. Louis Exposition in 1904. Afterward the Palace was taken to pieces, transported to Rio and re-assembled at the point where the Avenida Rio Branco joins the Avenida Beira Mar at the edge of the bay.

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THE AVENIDA RIO BRANCO IS THE BOAST OF THE CITY

This glimpse of Rio de Janeiro's finest street shows the carefully planted gardens, and some of the trees which line the Avenida in a triple row. The famous sidewalks are paved with mosaic tiles in a different pattern for each block. The magnificent Municipal Theatre is visible through the trees, and the tall buildings just across the street house other theatres.

R. R. Walls

HOW A RIVER LOOKS WHEN IT HAS BEEN WORKED FOR DIAMONDS

The most famous diamond fields of Brazil are in the Diamantina district in the state of Minas Geraes. The diamonds do not occur in deep mines like those of South Africa, but are found in rivers and streams of a certain type. The earth and gravel of the river-bed are dredged out or washed out by streams of water, and then the prospectors take big sieves and carefully search every bit of gravel for the precious stones. The long pipe carries water to the place where excavations are being carried on at Boa Vista. Minas Geraes is also rich in gold and iron.

Geological and Geographical Commission of the State of S. Paulo

WHITE COAL THAT IS WORTH MORE THAN DIAMONDS

Brazil is a land of rivers, and almost every state is watered by beautiful streams. In the rainy season even the tiniest watercourse becomes a torrent, and as rapids are numerous there is an almost unlimited supply of water power for generating the electricity which runs factories and lights cities. This picture shows the Falls of Marimbondo, in the state of São Paulo.

Rio has been the capital of Brazil since 1762. It is remarkable for its fine buildings and promenades and its streets lined with outdoor cafés and magnificent shops. The Avenida Rio Branco claims to be the finest street in South America, and certainly only the Alameda in Santiago and the Avenida de Mayo in Buenos Aires can rival it. Sauntering along it, we meet typical Brazilians, well-built, handsome people with dark hair, eyes and skins. Men and women alike are fond of dress and display, and the flashing diamonds that have made the Brazilian mines famous are much in evidence. Although ancient barriers are now breaking down and women have lately found employment in business, most upper-class women take little share in public life, and live their lives very much in their homes. The prosperous Brazilian is very generous to his poorer relatives, and, as in Argentina, it is not uncommon to find many branches of the family living together in one large house.

Sunday is divided between the church and amusements. It is the day set apart for horse races, for family picnics, or expeditions into the hilly country around the city. A rack-railway runs up the near-by mountain of Corcovado (the Hunchback), which like the Sugar Loaf commands a bird's-eye view of the city and the bay. Both are very popular resorts, especially on the numerous saints' days and festivals. The annual carnival lasts for four days and then Rio is at its gayest. At night everyone, young or old, rich or poor, masquerades in fancy costume on the brilliantly lighted Avenida Rio Branco.

The passers-by on Rio's streets form a motley crowd at any time. There are black faces, white faces, brown faces, yellow faces; ragged barefoot workers and men and women dressed in the height of

A SNAKE FARM THAT IS PART OF A GREAT SCIENTIFIC INSTITUTE

At Butantan, near São Paulo, there is an institute for the study of antidotes to snake-bites. Serums are prepared from the blood of horses which have become immune by repeated injection of small doses of poison. The snakes live in the dome-like houses and when wanted for venom they are dragged out with a pole such as the man is holding.

style. Porters and peddlers pass carrying on their heads anything from a trunk to live chickens. The Rua do Ouvidor, like Calle Florida in Buenos Aires, is a narrow, tile-paved street where all the most expensive shops are located, and every other window seems to belong to a jeweler's store.

The state of Minas Geraes is the home of the Brazilian diamond, but the secret of its wealth was hidden until 1727, when someone discovered that the Negroes of a certain place were using rough diamonds as counters when playing cards. Gold and minerals of all kinds are found in the mountainous districts of this and the adjoining states. Minas Geraes has iron deposits estimated to be the largest in the world, and is also a fertile populous state where corn and coffee, cattle and tropical products all thrive alike.

The big cacao and tobacco plantations are in the state of Bahia, where there has been little or no immigration from Europe. A large percentage of Brazil's Negro population is concentrated here, for in the days of slavery the city of Bahia was the greatest slave-port in South America. Its harbor is called All Saints' Bay and is almost as beautiful as the Bay of Rio de Janeiro. The town is divided into two portions, the lower part around the waterfront and the upper on the cliffs behind. The houses are red-tiled and painted in various colors, with beautifully wrought ironwork at windows and doors; often the walls are decorated with exquisite Portuguese tiles. The narrow quaint streets of the old sections are like picturesque corners in Portugal. Negroes and mulattoes form a large part of the population. The working women wear full, print dresses with fringed shawls draped around their shoulders and colored bandannas on their heads; an assortment of jewelry—necklaces, bracelets, and big golden earrings—completes their costumes. Even the men's cotton shirts are of gay checks or floral patterns. Both men and women

carry burdens of all descriptions on their heads.

The low-lying city of Recife, which takes its name from the coral reefs at the harbor-mouth, is also very pleasing, with its houses painted plum color, red, pale emerald or forget-me-not blue. One of the sights of the streets is that of the milkman going his rounds, leading a cow with her calf tied to her tail and accompanied by a boy who carries a bottle to be filled with milk to order. Another is that of porters carrying on their heads loads of sugar, for this is the entrance to the great Pernambuco region of sugar production and cotton-growing. Recife is in the tropics and on the coast, but it rivals São Paulo and Santos in enterprise, a fact which may possibly be traced to the Dutch ancestry of many citizens. The Dutch occupied Recife during part of the seventeenth century.

Perhaps the most romantic part of Brazil is the valley of the Amazon. Rising in Perú, the "Sea River," as it is often called, flows for nearly four thousand miles right across the continent, and into it, all along its course to the Atlantic, flow other mighty streams. The tropical Amazon valley covers the greater part of three million square miles and includes the three largest states of Brazil—Amazonas, Pará and Matto Grosso. Much of another big inland state, Goyaz, is drained by the same river system. This immense region has been described as "trees, water and wilderness." Its only roads are the rivers; its only settlements are on the river banks; its few towns are river ports. The only railroad in the whole region—except one or two short lines on the coast—is the Madeira-Mamoré line around the rapids of the Madeira River, and that is said to have cost a life for every tie laid. Matto Grosso means "great woods," and another name for the vast wilderness is the Green Hell, for the forest seems to cover everything. But all of Amazonia is not jungle, and even the jungle is not always unconquer-

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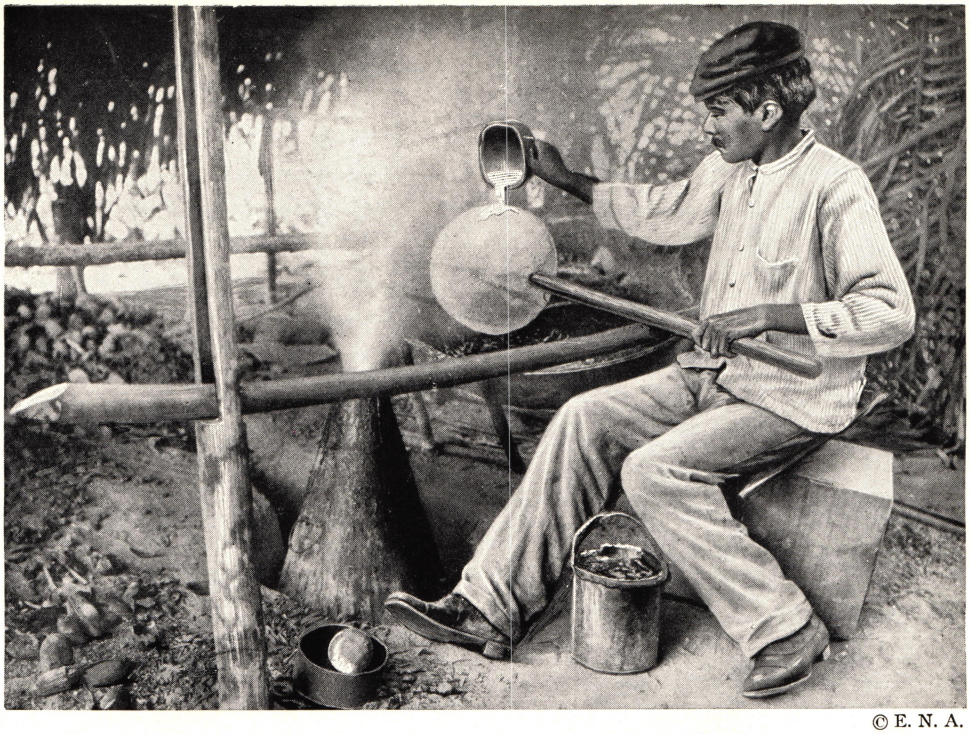
PICTURESQUE BAHIA WAS ONCE THE CAPITAL OF BRAZIL

The streets of Bahia are as colorful as an artist's palette, and as picturesque as those of Portugal. Little mules with jangling bells on their harness toil up the steep cobbled streets which lead from the lower level to the upper. Here we are looking out over the business section of the lower town to the docks and harbor beyond.

Gaumont Co.

TAPPING A RUBBER TREE IN THE DARK AMAZONIAN FOREST

Brazil is the home of the rubber tree, which grows here and there in the dense trackless forests. Rubber gatherers—the "seringueros"—search out the trees and tap them for the sticky liquid. Many trees have been killed by careless methods, and unscrupulous seringueros have caused much trouble with the Indian tribes, forcing them to bring in rubber.



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HOW THE SERINGUERO PREPARES THE RUBBER HE COLLECTS

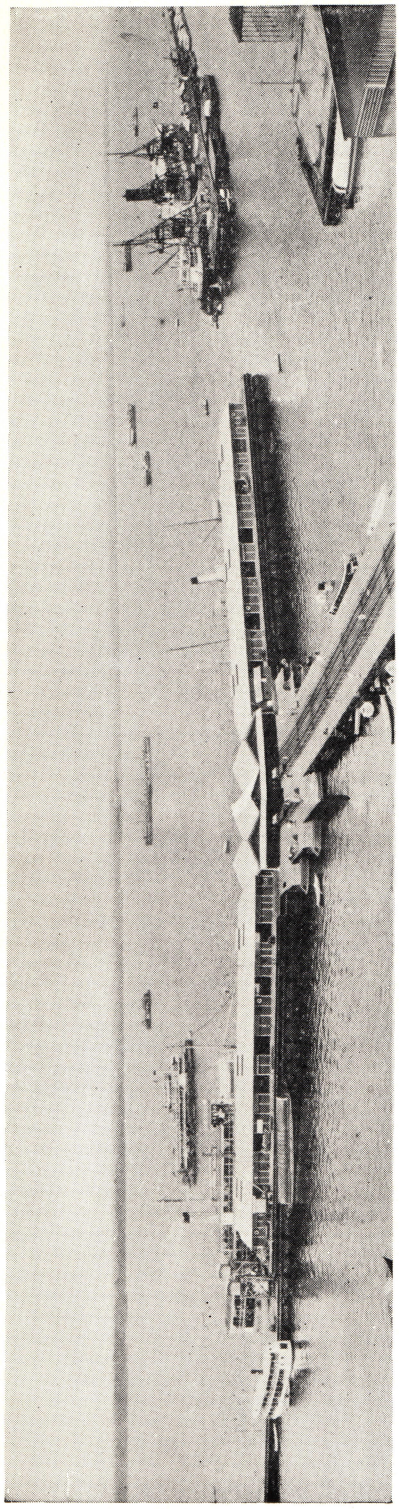
When he has collected enough liquid latex, the seringuero builds a fire and constructs a funnel over it. He dips a wooden paddle into the sap, then holds the end in the smoke and rotates it. The heat hardens the latex, and layer after layer is slowly added until a big ball of crude rubber is formed. At the end of the season he takes his rubber down to Manáos.

able. The value and variety of forest products is a great inducement to development; balata, rubber, Brazil nuts, hardwoods and dyewoods of all kinds, cacao and drugs come from the woods. Then there are grassy uplands or "campos" which make excellent cattle country.

In the heart of this region, on the Rio Negro, seven miles from its junction with the Amazon and about a thousand miles from the sea, is Manáos—a modern city with a cathedral and theatre, electric cars, automobiles and floating docks; ocean-going steamers can navigate the Amazon as far as Iquitos in Perú. Manáos owes its importance to rubber, which is still the chief product of the Amazon basin even though the wild rubber of Brazil no longer rules the market.

The Rio Negro, or Black River, is the Amazon's biggest tributary from the north, and it drains most of northwestern Brazil to the Venezuelan and Guiana borders. Many rivers pour into the muddy, yellow Amazon from the south, and of these the Madeira, which rises in Bolivia, is the largest.

Along the river banks the forest is well-nigh impenetrable. This wilderness is the home of the rubber tree, of which the latex provides the queer elastic substance used in making waterproof clothing, shoes, automobile tires and countless different articles. Without rubber our life would be very different. Other trees of all kinds, festooned with creepers and orchids, make a home for chattering and howling monkeys, bright-feathered parrots, toucans, dainty humming-birds and egrets. Mosquitoes, gnats and ferocious ants are far too numerous for comfort. The swamps hold snakes, the rivers are infested with alligators and swarm with fish, one of which, the piraracu, is as big as a tarpon and provides excellent sport. A dangerous fish is the vicious little one which is called "piranha" in Portuguese and "piraña" in Spanish. Large turtles



Publishers Photo Service

AT MANÁOS ON THE RIO NEGRO THE DOCKS MUST FLOAT ON THE WATER

This big T-shaped dock is built on pontoons so that it can rise and fall with the river, because during the winter rains the level of the water rises thirty or even as much as fifty feet. The connecting bridge is fastened to the shore by giant hinges. Manáos is a great rubber centre.

are plentiful and roast turtle is the sirloin steak of the Amazon. Turtle eggs also are gathered by the million, for the sake of the oil and turtle butter that can be obtained from them. That curious animal, the manatee or sea-cow, which has started many a mermaid legend, is also found in Amazon waters.

In the forest lands and swamps of the Amazon valley, the wild Indian is at home. It is possible to go for days up the rivers without seing one brown form, for villages are built back from the banks and carefully concealed. Sometimes the only evidence of human presence is a half-hidden canoe, which gives the traveler the uncanny assurance that hidden observers are watching him and may spread news of his coming. The possibility of a shower of poisoned darts from an unseen foe has always been a great obstacle to the exploration of more distant sections. The rubber gatherers are responsible for the hostile attitude of Amazon Indians, whom they cruelly mistreated in the days when Pará rubber supplied the world's market—before plantation rubber from the east broke the Brazilian monopoly. Nowadays the tribes are very suspicious of white men, but if treated in a friendly manner they will respond. One traveler went exploring some of the tributaries of the Rio Negro, and reported that everywhere he met with kindness and courtesy from the natives. He spent some time with them in one of their maloccas, or communal homes. These large round houses, which are thatched with palm leaves, often contain a whole tribe of thirty or more. All round the walls is a series of partitions, marking off family dormitories. The large space in the middle is used for tribal celebrations, dances and feasts. The men fish and hunt; the women cultivate plantains and manioc in small clearings and do a certain amount of weaving—though clothing is not much in demand and consists of little besides loin cloths and occasional necklaces of beads and animals' teeth. Manioc is the same as the cassava eaten in Guiana and is a staple food throughout Amazonia. The roots

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FESTIVAL FINERY OF A BRAZILIAN PAN

This Indian musician is a member of a tribe that has come under civilized influence, for he wears clothes of coarse cotton. His fibre bracelets, toucan feathers and colored beads, however, are forest finery. Brazilian Indians are often very musical; this one uses an instrument familiar in many lands—the reed pipes which we call the Pipes of Pan.

are big and chunky, and are grated on a board set with the sharp teeth of the piranha. After that the pulp must be mixed with water and squeezed to extract the poison it contains, and then it is ready to be made into cakes or flour called "farinha" which is the basis of every meal, whether in the wilderness or in Manáos.

The Indian Protection Service of the Brazilian government has tried many ways of getting in touch with the shy, often hostile tribes. One novel method is used in the forests of Matto Grosso and Goyaz. A camp is pitched in the forest, and pathways are cut in different directions. Every half mile or so along these paths an "attraction post" is set up and hung with knives, bright cloths and beads—such articles as the natives appreciate. Then a man sits in a shelter high up in a tree and speaks through a megaphone in the dialect of the tribe, telling them that the goods on the posts are gifts and that more are waiting at the camp. Once the confidence of the Indians is secured the next step is to give them medical treatment and agricultural implements, showing them how they can make their lives more comfortable. In one part of Matto Grosso the tribesmen were usefully employed in guarding the long telegraph line to the Amazonian waterways, within a year after the erection of the attraction posts. By this method of peaceful penetration it is possible to make the Amazon valley—the great tropical heart of Brazil and all South America—reveal its secrets and yield up its riches.

The wilderness country is an empire in itself, yet so far removed from the civilization of Rio and São Paulo that many city dwellers know relatively little about it. Brazil as a whole—from jungle lands to coffee fazendas and beautiful cities—is an enormous, amazing land, with possibilities as great as its size.

BRAZIL: FACTS AND FIGURES

THE COUNTRY

Bounded north by Colombia, Venezuela and the Guianas; northeast, east and southeast by the Atlantic; south by Uruguay, Paraguay and Bolivia; west by Argentina, Paraguay, Bolivia, Perú, Ecuador and Colombia. Area, 3,285,318; population (estimated, 1929), 40,272,650. Island of Fernando de Noronha, 125 miles off the northeastern coast, belongs to Brazil.

GOVERNMENT

Federal republic (*Estados Unidos do Brasil*) of 20 states, 1 Federal territory and 1 Federal district; the states are administered without interference from the Federal Government except for defense, the maintenance of order and the execution of the Federal laws. President and Vice-President are elected directly by the people for 4 years and are ineligible for re-election. There are 7 Secretaries of State. National Congress consists of a Chamber of Deputies (212 members) and a Senate (63 members). Property and literacy qualifications for franchise; members of religious orders cannot vote.

COMMERCE AND INDUSTRY

Country essentially agricultural. Coffee (¾ of the world's supply) and rubber are the chief products. Other products: corn, rice, sugar, manioc, potatoes, wheat, cotton, cacao, tobacco. Besides rubber, the forests produce Brazil nuts, babassu nuts, carnauba wax, yerba maté (herva matté, Paraguayan or Brazilian tea), timber, balsams and oils. Rich mineral deposits include coal, iron, gold, diamonds, manganese and monazite (a great part of the world's supply comes from Brazil). Stock-raising is a growing industry. The chief manufactured goods are cotton, textiles, paper, cement, tobacco and watches. Exports: coffee, cacao, hides, yerba maté, rubber, carnauba wax. Imports: machinery, iron and steel goods, motor cars, gasoline and kerosene, cotton goods, wheat and flour.

COMMUNICATIONS

Railway mileage, 19,544, largely state-owned. Length of telegraph wire, 102,362 miles; of telephone wire, 270,617. About 40 wireless stations. Highway mileage, 33,452. Mail and passenger aviation have developed rapidly.

RELIGION AND EDUCATION

Absolute religious equality. Education is free, but compulsory in only 7 states. Higher education is provided in 1 official university (Rio de Janeiro) and in 2 private universities, besides many professional and technical schools.

CHIEF TOWNS

Rio de Janeiro, the capital, 1,468,621. Estimated population (1929) of other towns: São Paulo, 879,788; Bahia (São Salvador), 329,898; Pernambuco (Recife), 340,543; Belém (Pará), 279,491; Porto Alegre, 273,376.

THE GREAT WHITE SOUTH

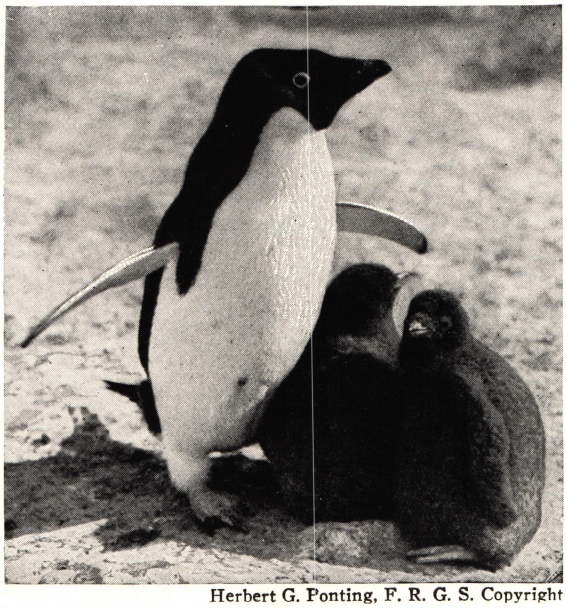
Antarctica Is the Coldest Region of the Earth

Fascinated by the lure of the unknown, courageous men in every age have penetrated strange territory and crossed uncharted seas, until to-day it seems as though no corner of the world were left unvisited. But if we look at a map of the southern hemisphere we shall see that the South Pole is located on a great continent, Antarctica, which is for the most part absolutely unknown. The Pole itself was reached by Amundsen and Scott after long years of patient and difficult exploration by many men, but in spite of that achievement even the fringes of the frozen continent have not been completely mapped. While such a large area remains unexplored, ambitious spirits will venture south again and again, seeking to map the mountain ranges and glaciers and discover, if possible, the causes of the frightfully severe storms which affect the climate of many parts of the world. Recent explorers have used aeroplanes in charting the icy wastes and in this way we are learning more of Antarctica in a short time than we now know after a century and a half.

AN inhabitant of Mars, looking at the earth through a telescope, would see no great difference between its two polar regions, for both would, at all times of the year, appear to him as circular patches of white. There would be only one noticeable difference: the circular region at the southern end would be rather larger than that at the northern end.

Yet to us, now that both poles have been reached, and the Arctic and Antarctic regions to some extent explored, the difference is marked. The Arctic is a deep ocean with large land masses surrounding it, while the Antarctic is a continent surrounded entirely by deep sea—a fair-sized continent, too, for its area is reckoned at about five million square miles. It may prove to be the highest land mass on the globe, for that part of the interior that is known is high plateau and mountain country, five to ten thousand feet above sea level, with some peaks much higher.

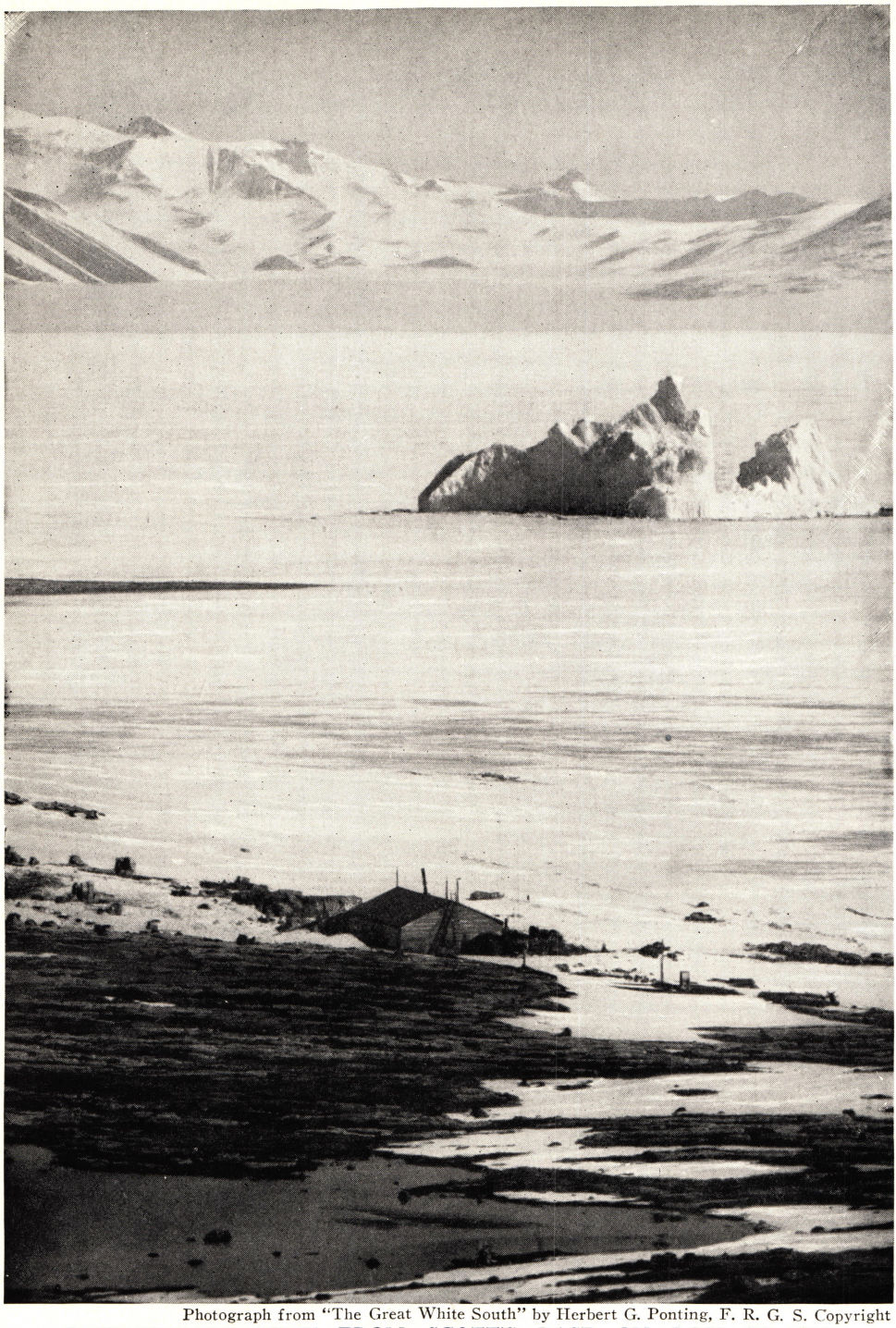
The whole of this desolate tableland is covered to unknown depths with snow and ice which have been accumulating for thousands of years and which are constantly pushing outward into the sea in the shape of enormous glaciers and a coastal fringe called barrier ice. Another name for this formation is shelf ice, because it gradually works its way into deep water until it makes a shelf along the coast and floats on the sea. In many places the ice extends so far out that it is impossible to tell where the coastline really is. The edge of the barrier, or shelf ice, may look like a stupendous wall from twenty to one



Herbert G. Ponting, F. R. G. S. Copyright

QUAINTEST BIRDS OF ANTARCTICA

The Adélie penguin is black and white when full grown, but the chicks are gray. The feathers are scaly-looking, and the wings, here outstretched to scare the photographer, are used only for swimming and fighting.



Photograph from "The Great White South" by Herbert G. Ponting, F. R. G. S. Copyright

SEVENTY-MILE VIEW FROM SCOTT'S BASE ON ROSS ISLAND

In 1911 Scott made his base at Cape Evans on Ross Island, at the western side of the Ross Sea and near the barrier. The hut which housed the expedition is seen here, and beyond, seventy miles away over frozen McMurdo Sound, are the mountains of Victoria Land. This picture was made by a camera with a telescopic lens.

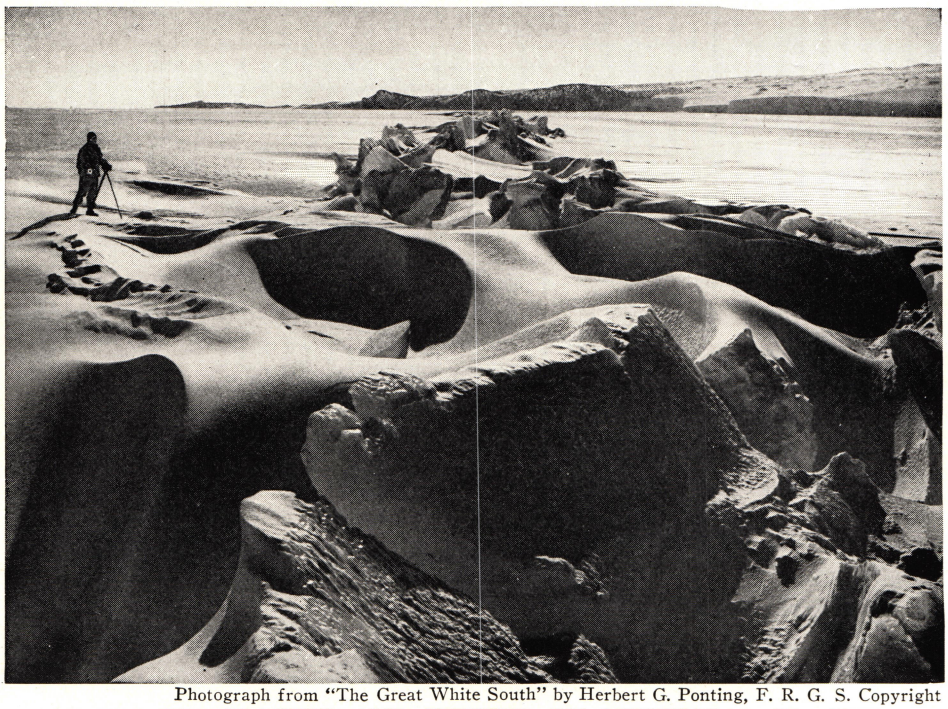
hundred and eighty feet high. In summer when the pack ice of the sea breaks up, the barrier throws off icebergs of a size and shape unknown in the northern hemisphere. This tremendous ice flow shows vividly how cold Antarctica is; it is a continent still in the grip of the Ice Age from which most of the rest of the earth has long been released. Greenland is the chief exception.

Because of the severity of the climate, exploration is beset with appalling hardships. Looking at the map on page 210, you will see that the continent itself is almost entirely within the Antarctic Circle, but in winter—that is from April to August—the encircling belt of pack ice extends much farther north and makes it impossible to sail much beyond the South Shetland Islands.

The first man to sail within the Circle was the great English navigator Captain Cook, who crossed it more than once on his voyages. In 1774 he held the record for "farthest south" and had effectively disproved the existence of the fabulous southern continent in which sixteenth-century geographers believed; they thought Tierra del Fuego was part of the unknown land and that it extended from there to the Pole.

Fabian von Bellingshausen was sent out by the Russian Emperor in 1819 and, circumnavigating the entire continent, he first discovered its unity and named Alexander I Land for his sovereign. After him came sealers and whaling captains, who pushed south every summer from British and American ports in search of oil and skins and did much to chart Antarctic seas. James Weddell, John Biscoe and John Balleny—all Englishmen—were the most successful explorers among the whalemen.

An increasing number of expeditions now went to the Antarctic; a Frenchman,



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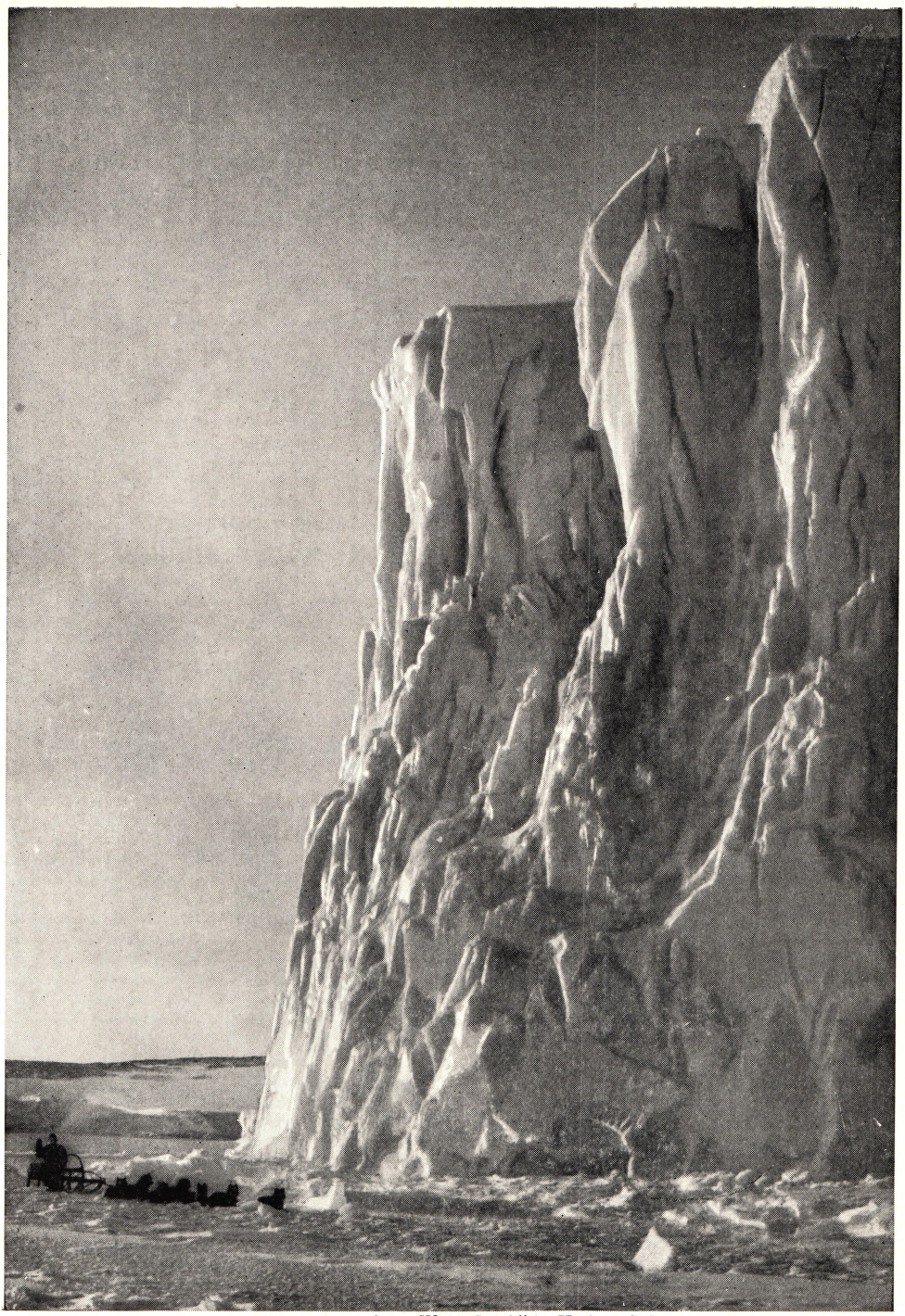
SHORE ICE CRACKED AND TWISTED BY MEETING A GLACIER

Taken on the shore ice—that is the frozen sea off the coast, which is seen in the distance—our photograph shows a pressure ridge thrown up where the Barne Glacier meets this shore ice. The pressure of the glacier causes the ice to crack and forces the broken masses upward. The man is Captain Scott, who died after reaching the South Pole in 1912.



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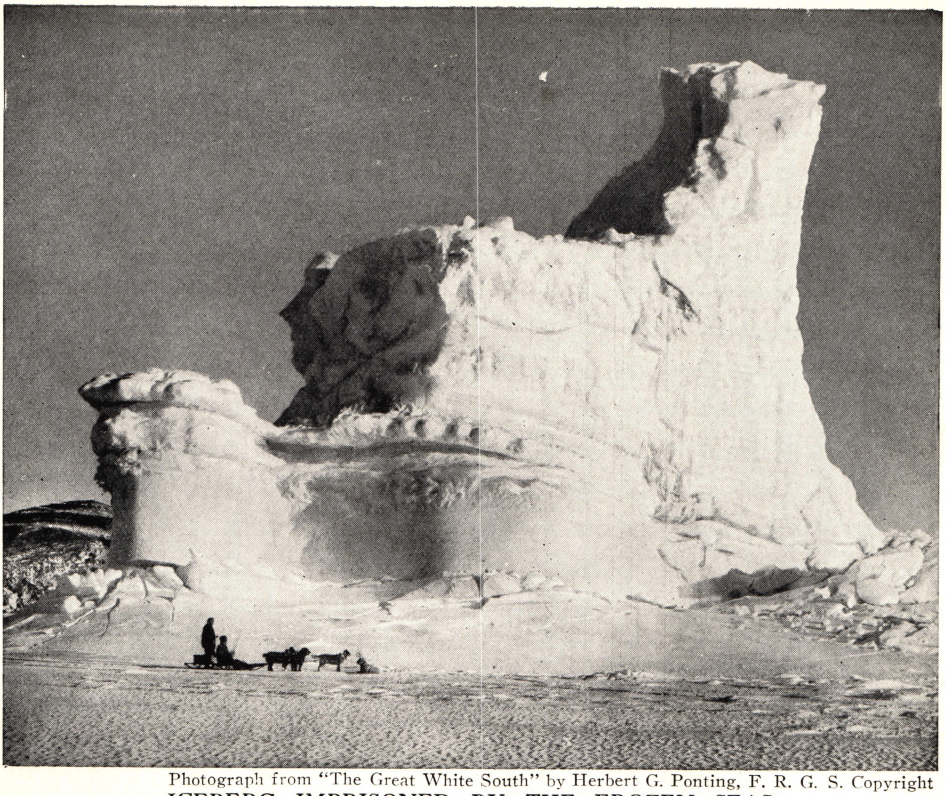
A DOG TEAM RESTING AT THE FOOT OF BARNE GLACIER

When the Ross Sea is frozen the edge of Barne Glacier stands out of the snow-covered ice like a cliff. One of Scott's dog teams is lying down for a rest on the shore ice at the foot of the glacier. Much of the exploring work was done with their help, and if Scott had used more dogs on the trip to the Pole they might have saved his life.



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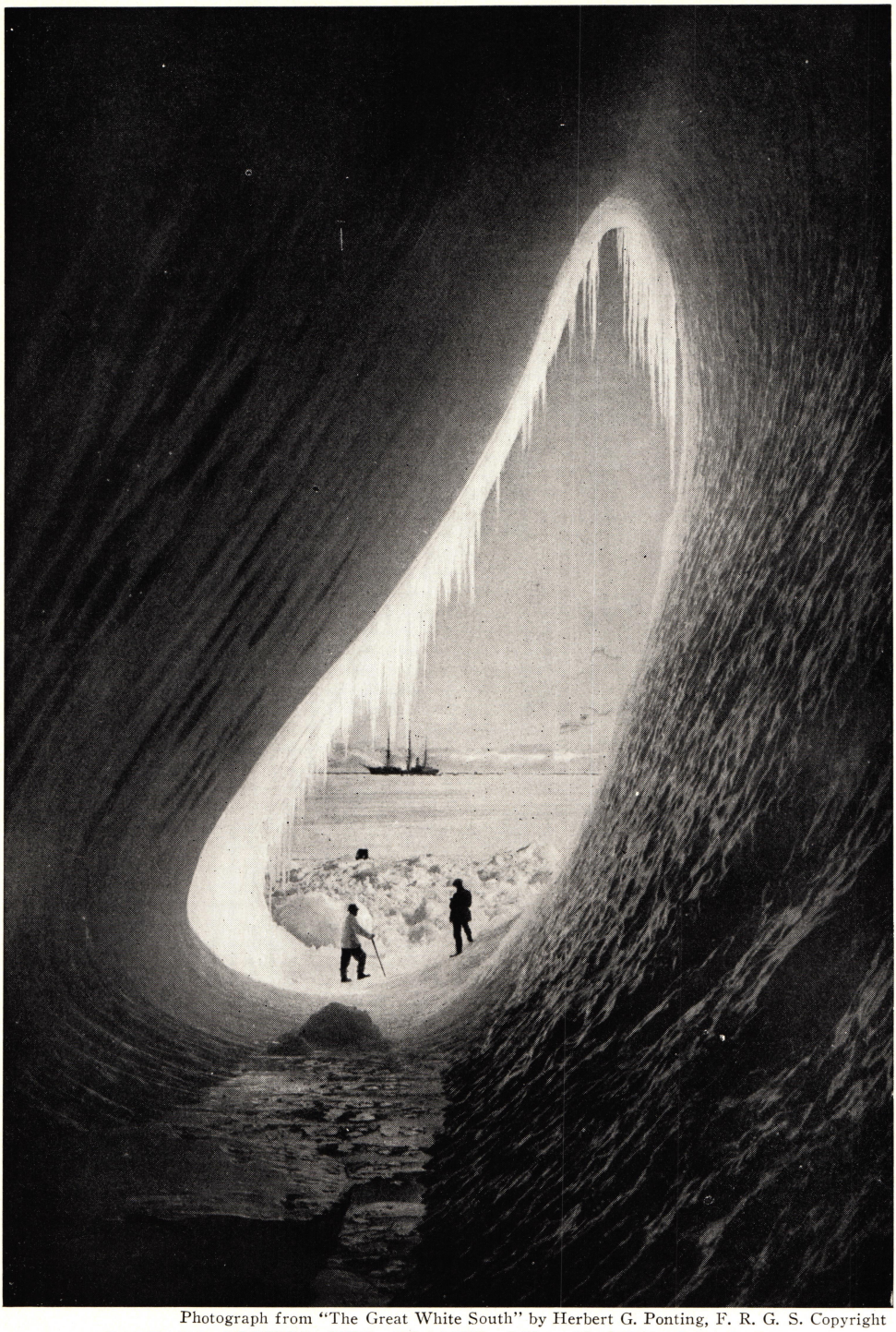
ICEBERG IMPRISONED BY THE FROZEN SEAS

Icebergs are pieces of a glacier that has crept down to the sea. The foremost part is buoyed up by the water, and great masses break off and float away. Antarctic bergs are rarely higher above water than the barrier which produces them, but they may measure as much as thirty miles in length and are really floating islands of ice.

D'Urville, an American, Charles Wilkes, and an Englishman, James Clark Ross—all naval officers—were at work there in the years between 1835 and 1845. Ross made an especially fine record of discovery; the Ross Sea, South Victoria Land, the Great Ross Barrier and three high mountains were all first sighted by him. A Norwegian, Borchgrevink, was with the first party which actually landed on the Antarctic continent and in 1899 he led the first expedition to spend the winter in Antarctica, at Cape Adare.

It was not until the twentieth century that the sea voyages were supplemented by land expeditions. A German scientific party under Drygalski discovered and explored Kaiser Wilhelm II Land in 1902. In 1901–04 Captain Robert F. Scott of the British Navy sailed to the Antarctic in the Discovery. He went to the Ross Sea, which has been the way of approach for most expeditions since, and made the first real attempt to reach the South Pole. With him was Sir Ernest Shackleton, who in 1908 led an expedition of his own and came within ninety-seven miles of the goal. Another man famous in the story of Antarctic exploration is Sir Douglas Mawson, who reached the South Magnetic Pole and did valuable work in Adélie Land with his Australian Expedition, from 1911 to 1914.

Meanwhile, England was not the only nation interested in finding the South Pole and when Scott went south on his second expedition in 1911 he was running a race with the Norwegian party under Roald Amundsen. From the Great Barrier on the shores of the Ross Sea they followed different routes, which are marked on the map. Amundsen with his dog teams reached the Pole first, on December 14, 1911; over a month later Scott worked



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CAPTAIN SCOTT'S SHIP FRAMED BY AN ICEBERG CAVE

Taken inside a huge cave in an iceberg, this photograph was only obtained at the risk of the photographer's life. It was summer-time and the ice was melting rapidly. At any moment the rift in the berg might have widened, letting masses of ice collapse upon the venturesome men. This is undoubtedly one of the most wonderful ice photographs ever taken.

Photograph from "The Great White South" by Herbert G. Ponting, F. R. G. S. Copyright

SEAL KEEPING A HOLE CLEAR IN THE ICE FOR FISHING

This is a picture of the coast in winter, when the sea is frozen into a white plain. The ice is seldom over five feet thick, however, and the movement of tide and currents causes it to crack, leaving gaps which are kept open by the seals diving in to catch fish. They can stay under the ice for as much as fifteen minutes, but must then come out again for air.

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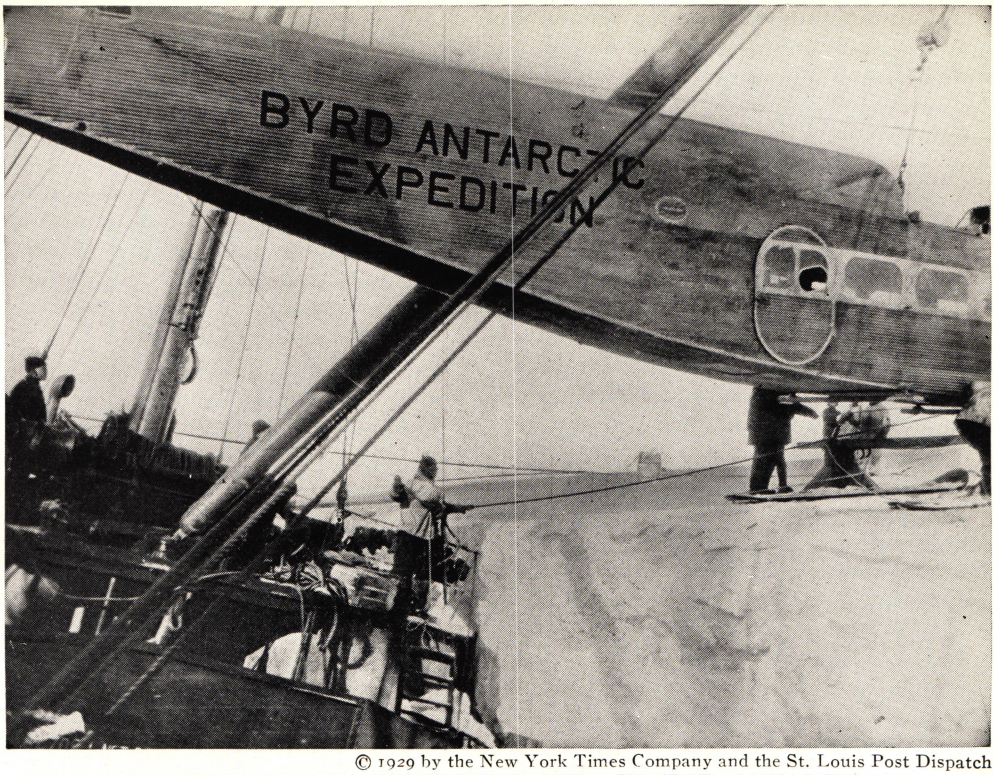
RADIO CAN LINK THE FROZEN SOUTH TO CIVILIZATION

Mechanical equipment is increasingly important in Antarctic exploration, and the radio towers at Little America, Byrd's base on the Ross Barrier, symbolize this development. But it is thorough preparation that means success in the Antarctic and this view shows the specially constructed houses, with piles of supplies of every conceivable kind, from food to skis.

his way to the spot, and to his bitter disappointment found awaiting him a letter from Amundsen. It was on their nine-hundred-mile march back from the Pole that Scott and his four brave companions perished of cold and hunger. One of them, Seaman Evans, died as the result of a fall. It was Oates who quietly walked away into the snow to die, hoping to give his leader a greater chance of life.

The Pole had thus been reached more than once in spite of overwhelming hardships, but there remained mile on mile of territory where no human being had ever set foot. Sir Ernest Shackleton met with disaster in the ice-packed Weddell Sea in 1915 but carried on the task of exploration until his death in 1922. A new factor in Antarctic work was introduced when Commander Richard E. Byrd of the United States and Captain Sir Hubert Wilkins of Australia began using aeroplanes for observation and mapping. Wilkins made the first flight in Antarctica in 1928, and the next year Byrd (recently created Rear Admiral in recognition of his polar exploits) flew over the South Pole. One great object of geographical interest is to learn whether Antarctica is really one continent or two, divided under the ice pack between the Weddell Sea and the Ross Sea. Sir Douglas Mawson led another Australian expedition in 1929, using his ship as a base and making short flights in a small plane. With this new means of transportation the terrible difficulties of slow travel by sledge no longer play such an all-important part in every expedition, and we may hope to learn more about the hidden continent in a few short years than many patient workers were able to find out during the last century and a half.

But the terrific hazards are there none



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AEROPLANES ARE SOMETHING NEW IN THE ANTARCTIC

Both Wilkins and Byrd had experience in Arctic aviation before using aeroplanes in the Antarctic. Byrd flew over the North Pole in 1926 and soon after began making plans for conquering the South Pole, which he did successfully on November 29, 1929. He has since been made Rear Admiral of the United States Navy in recognition of his achievement.

the less, and climate is responsible for most of them. At one time this land of ice had a warm climate, for coal deposits exist and fossilized leaves of pine trees and ferns have been discovered. But at present the cold is incredible. Even in summer, when the sun is constantly above the horizon, the air temperature inside the Antarctic Circle never rises above the freezing point. In January, 1909, when Shackleton was within reach of the South Pole, a three-day blizzard was made worse by a temperature of 70° below zero—and what is January in the southern hemisphere, remember, corresponds to July in the northern. In the Arctic rain falls at times during the short summer, but in the Antarctic the only precipitation is of snow, usually in fine grains that cut and sting like dry sand. The wind is hardly ever still; frequently it blows a heavy gale commonly rising to hurricane force; then its fury is appalling. When the Swedish Expedition under Dr. Nordenskiöld camped on Snow Hill Island in 1902–03 they chose a site for their station which they believed would be sheltered from the worst of the wind. Yet a gale from the southwest picked up a large bag of heavy fossils and blew it twenty yards; another time a big whale boat was lifted and flung the same distance, landing against a mass of ice, and on examination it was found that the zinc plating had been stripped completely off. This particular gale carried away the wind gauge, so it can only be said that the air was moving at over a hundred miles an hour. Admiral Byrd's party experienced one gale in which the wind reached the terrific velocity of 120 miles an hour. Mawson's men learned to guess the velocity from the tone of the wind's roar outside their hut. During such storms the air becomes so charged with electricity that the metal parts of instruments give distinct shocks

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IN THE STILLNESS OF THE FROZEN SOUTH: ADÉLIE PENGUINS RESTING ON AN ICE FLOE

One of the chief hardships explorers have to endure is the blizzard. The terrific force of the wind, the intense cold that drives through any clothing, and the pelting snow, make it impossible to leave hut or tent. But when the wind is gone complete silence reigns unless birds or seals are near, in the ever-changing channels between the floes, or fields of pack ice, and the edge of the mainland. Penguins who have been hunting shellfish in these water lanes often shoot suddenly to the surface and jump out on to the ice in companies.

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THE EMPERORS COME TO CALL

Penguins are very much interested in men and not in the least afraid of them, and will come miles to satisfy their curiosity. Admiral Byrd and his fox terrier, Igloo, are getting acquainted with a party of Emperor penguins on the ice at the foot of the barrier. Igloo is the dog who flew over the North Pole with Byrd.

when touched, while the tips of men's fingers glow with brushes of light in the darkness.

On the rare occasions when it is fine, the sunrises are beautiful beyond description. "At about 10 o'clock," said Nordenskiöld, "a glowing spot begins to be visible on the horizon, and preceded by a perpendicular pillar of fire there rises what should be the orb of the sun, but what, in consequence of 'refraction,' appears to us to be a broad, flaming belt of fire. On each side are two shining, intensely rainbow-coloured belts."

We have all heard of or seen the Northern Lights, which are sometimes visible as far south as Florida. The Southern Lights are fully as splendid and wonderful; now they are like golden curtains, and again they form racing rays of green, rose and violet, making the perpetual night luminous with their soft brilliance. When winter is over and the sun comes above the horizon once again, its light turns the snowfields into sheets of blinding splendor. For the Antarctic is as beautiful as it is sinister, and if it threatens venturesome men with hardships and death, it also rewards them with unforgettable experiences of beauty. To stand on the pack ice at the foot of the great barrier and look up is to gaze upon sheer towering cliffs of clear ice which shades from dazzling white, pale green and radiant opal on the surface to silver, ghostly blue and black in the depths of some crevasse. Sailing through the pack ice on a clear day is like moving in a world of blue and white—azure sky, and blue lanes of water through floes of purest crystal, with here and there a giant berg dominating the scene majestically.

The most striking thing about the Antarctic continent is its volcanic structure. There are many extinct volcanoes, and Mt. Erebus, which rises to a height of 13,300 feet, is still active. Its crater is half a mile across and nine hundred feet deep. It throws out vast volumes of steam and sulphurous gas, yet the temperature near the summit was 50° below zero the day a party from Shackleton's Expedition reached the top.

Because of the extreme cold and the great distances that separate it from other continents, Antarctica has none of the wonderful life of the far north, musk-oxen, wolves, polar bears, Arctic hares and foxes, and birds. In summer those low-lying plains are covered for a few weeks with a blaze of flowers, but on the Antarctic continent there grows not so much as a blade of grass, and vegetation is represented by only a few mosses and lichens. There are no land-dwelling animals at all, and few insects. Within

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WHERE PENGUINS REAR THEIR CHICKS: A ROOKERY BELOW THE VOLCANO OF MOUNT EREBUS

During the summer Adélie penguins leave the sea and come on to the land to lay their eggs. The birds make nests of stones, and if there are not enough, steal some from the neighbors. These thefts and the rivalry of the males start many fights and keep the whole rookery in an uproar. While the eggs are hatching the parents take turns guarding the nest and going off to the sea where they get all their food. When the Shackleton exploration party landed in 1908 the birds took the greatest interest in them and would come miles to inspect the camp.

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THE ADÉLIE PENGUIN'S FORMIDABLE FOE: SKUA GULL WITH ITS EGGS

The big Skua gull is as large as a goose and very fierce. It is particularly fond of penguin eggs and young chicks and always nests near an Adélie rookery. Hovering overhead, it waits until it sees its chance, then swoops down like a flash and spears an egg with its beak or snatches a poor squawking little chick in its claws.

the mighty ice cliffs that ring it round, the great central desert of ice is the most lifeless area anywhere on the face of the planet.

Yet although animals cannot exist on the ice cap, the cold waters surrounding it teem with life. Fish are plentiful, whales spout in the open leads of water and seals bask on the ice floes. There are sea birds by the thousand—penguins, petrels and gulls.

The penguins are by far the most interesting, because, as a great naturalist has remarked, "they are the most unbirdlike of birds." For one thing they cannot fly, but on the other hand they are magnificent swimmers. Their small, stiff, scaly wing stumps serve as admirable flippers in the water, and as forefeet on land. The birds use them as such in order to climb steep slopes. Their feet are placed so far back that the body is quite upright when the bird is standing on the ground. They walk in this position, and, although they cannot go fast on their short legs, travel long distances. On smooth ice or snow they drop flat and "toboggan" along by pushing with wings and feet. Their powers of diving and swimming are amazing. Sir James Ross once saw two penguins swimming at a distance of a thousand miles from the nearest land. For a bird that cannot fly, such a feat of endurance seems beyond belief.

There are at least six varieties of penguins in the far Antarctic and of these the Adélie is the most numerous. Though smaller than the others, it is a fair-sized bird, standing about two and a half feet high. The biggest is the Emperor, a very fine fellow over three feet tall when full grown and weighing as much as ninety pounds. Penguins are protected from the bitter cold by a thick layer of fat and a most wonderful coating of warm feathers. They live mainly at sea, and only come ashore to breed.

The Emperor penguin breeds on the ice, and as the chicks need many months in which to develop properly after they are hatched, lays its one egg in July—that is, midwinter. The egg is not left on the ice; if it were, it would be frozen solid

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LARGE WEDDELL SEAL LEAVING THE SHORE ICE TO HUNT FISH OFF ROSS ISLAND

In 1823 James Weddell discovered and explored the Weddell Sea and brought back a specimen of the seal which also bears his name and is among the largest of the Antarctic seals. On land the animal moves in a series of lunges, pushing with its front flippers, but once in the water it is a fast, graceful swimmer. This seal has just put its head over the edge of the shore ice off Cape Evans and is about to slither into the sea, where it may disappear for fifteen minutes before coming up to breathe. It lives on fish and Adélie penguins.

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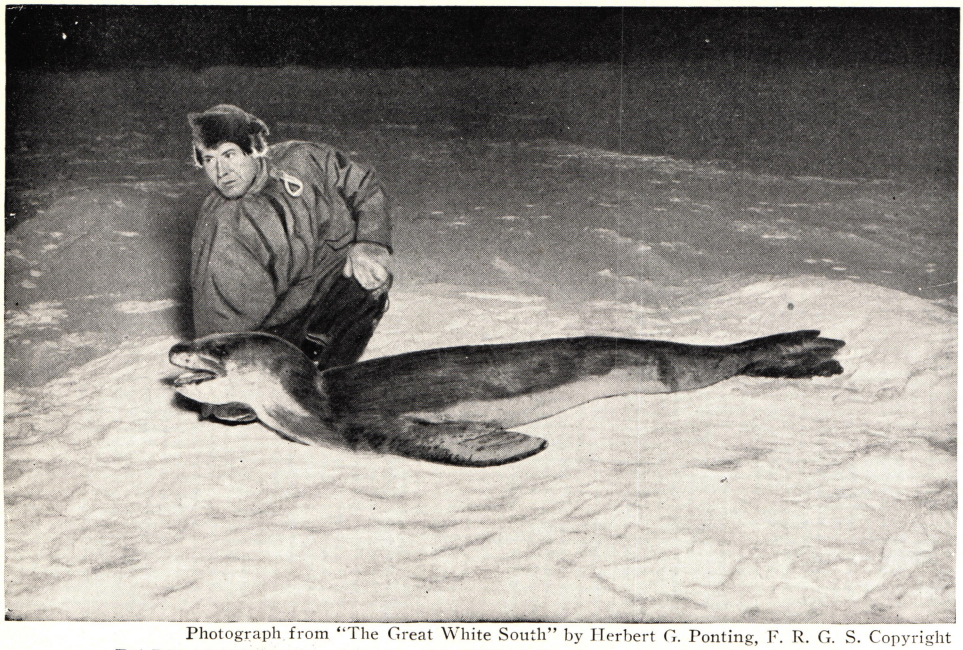
WEDDELL SEAL MOTHER WITH HER CALF, BOTH UNAFRAID OF THE CAMERA

Weddell seals keep to the sea near the mainland, which is often impossible to reach by ship, and they are not hunted because, not being fur seals, their skins have no commercial value. When men first visited these regions the animals did not fear them, and took little notice unless actually attacked; then they became frightened and wary. On land seals can only shuffle along about as fast as a man can walk. This picture was taken by one of Captain Scott's party and both animals are keeping a careful eye on the photographer.



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RARE LEOPARD SEAL CAPTURED BY THE EXPLORERS

The sea leopard is the fastest and strongest of Antarctic seals and attains great speed in the water. It has an immensely powerful head and neck and its long tapering body is mottled black and gray, somewhat like the pattern on a leopard's coat. Sea leopards live on penguins and fish and grow to over ten feet long. They are solitary and have seldom been captured.

in no time at all. It is held between the feet and the body of the parent bird and covered with a curious flap of skin which is dropped over it. But though most of the eggs seem to hatch, the poor chicks have a cruelly hard time of it; they are exposed to temperatures of fifty or sixty degrees below zero and if they escape the cold are often killed by kindness because the adult birds are too eager to protect them. It is said that only one in four survives until the spring. The habits of the Adélie seem more sensible to us, for the birds come in off the pack ice in spring and gather in huge rookeries on the barest ground they can find near the sea. The nests are made of pebbles which the male bird collects while the female does the building. Since it is hard work carrying stones for long distances in the beak, many birds try to steal from their neighbors' heaps. If a thief is caught there is a great to-do, and all through the breeding season these quarrels go on. The old birds take turns on the nest; one keeps the eggs warm for ten days or two weeks while the other goes off to eat, walking all the way down to the sea to dive for the shellfish on which it feeds. After the eggs have hatched, the parent birds come and go every day or two, bringing food for the chicks. The little ones grow very rapidly, and soon are too big to be fed by one parent at a time. Then the old birds of the neighborhood co-operate; they collect all the chicks from the various nests and mount guard a few at a time to keep them from running off, while the rest of the parents are free to go for food.

What make penguins the most interesting of all birds are their social habits and their strikingly human appearance, which depends partly on the way in which they stand erect and use their dwarfed wings as arms, and partly on the striking black and white plumage of some species. In all their movements ashore they have an absurd likeness to man, and often a group of them looks for all the world like dapper, pompous little gentlemen in evening dress, gravely discussing politics. When they quarrel, the resemblance is even more absurd. A penguin falls out with its neighbor, and a wrangle begins. The two

birds scold like old women; other birds thrust themselves into the quarrel, voices rise higher and higher, and at last one attacks the other with beak and flippers. Then the fight rages wildly, and throws the whole colony into an uproar. A delightful penguin habit is speech-making. Especially ceremonious are the Emperors; they are most courteous when they meet another party, or even human beings, whom they seem to mistake for a larger variety of themselves. The group will halt and then one of the older birds steps forward, bows in a portly manner and delivers a long series of gobbling noises like a public speech, until perhaps a rival, who thinks he can do it better, elbows him aside and goes through the whole performance again.

In the water, penguins are marvelously agile and graceful. They swim and play about like a crowd of boys, although seals are constantly lying in wait to make a meal off the smaller birds.

The sea-elephant is the biggest of the seal family; it is even larger than the great walrus of the Arctic and actually bigger than the real elephant. Specimens have been killed twenty feet long and twelve feet round the body. The animal has no trunk, but its heavy nostrils swell out into a snout a foot long, and its huge mouth is armed with long yellow teeth. When enraged the great beast bellows loudly, but though it looks very terrifying it is really a defenseless creature on land. Its flesh is black and oily but its fat yields good oil and the tongue is a delicacy, so it is rapidly being destroyed by hunters.

Another southern seal, the sea lion, is a trifle smaller than its northern namesake of California and Alaska. The male has a fine curly mane, but the female does not and is so much smaller that she is often mistaken for a different sort of seal. The sea lion grows to a length of ten feet, about the same size as the rare sea leopard.

Even the seals must find life difficult during the Antarctic winter, for the whole sea freezes over inshore and they have trouble in keeping open gaps through which they may come up to breathe.

Whales of many kinds are plentiful in the Antarctic, and of late there has been a great revival in the whale fishery. Norway is the centre of the industry to-day and more than one hundred Norwegian ships are engaged in southern whaling; some of the vessels are floating refineries with capacity for ninety thousand barrels

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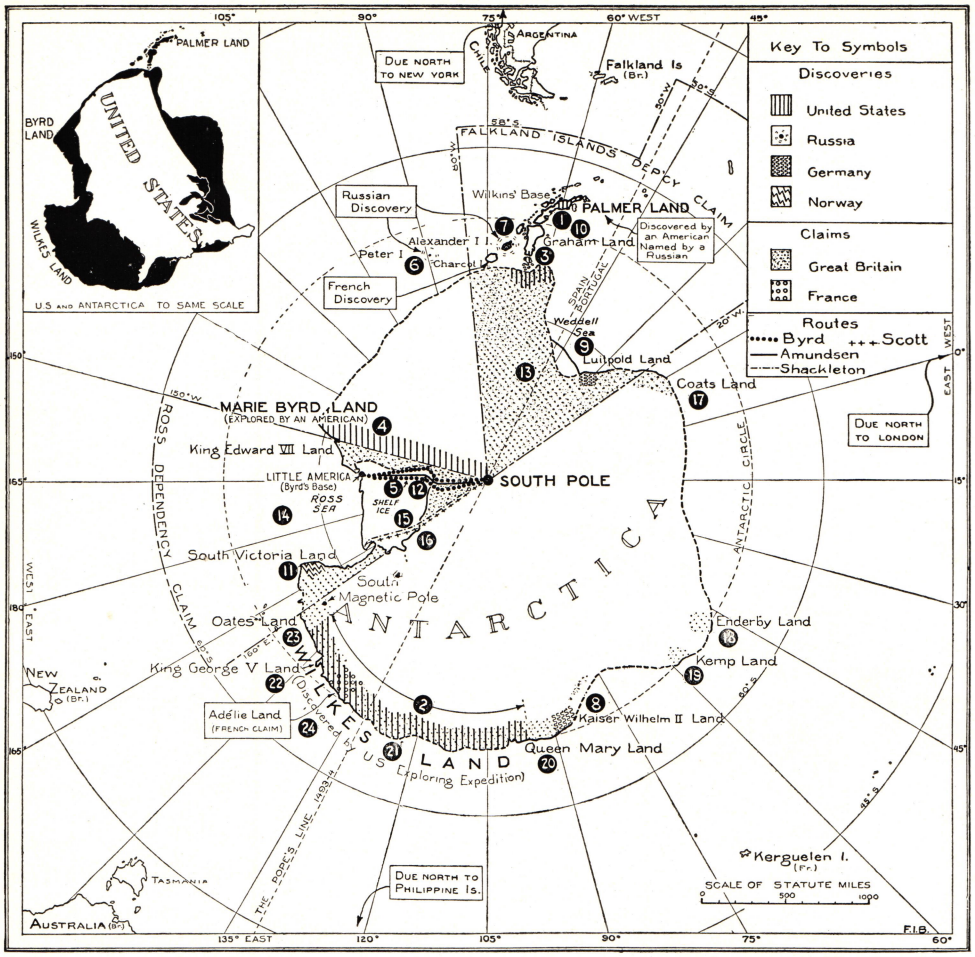
VINCE'S CROSS UPON THE SUMMIT OF HUT POINT PROMONTORY

On the top of Hut Point stands a white wooden cross which was erected to the memory of George T. Vince, a seaman of the British Navy who accompanied Scott's Discovery Expedition in 1901–04. He lost his way in a blizzard and was killed by a fall from an ice cliff. Scott's first winter quarters were at Hut Point, which is on Ross Island.



Courtesy The New York Times

Discoveries and Explorations:—*United States*—(1) Palmer Land; (2) Wilkes Land; (3) S. E. Graham Land and to south (Wilkins, 1928); (4) Marie Byrd Land and (5) Route to Pole (Byrd, 1928–29). *Russian*—(6) Peter Island; (7) Alexander I Island. *German*—(8) Kaiser Wilhelm II Land; (9) Luitpold Land. *Norwegian*—(10) Western part Weddell Sea; (11) Near Cape Adare; (12) Route to South Pole (Amundsen, 1910–11).
Claims and Explorations:—*British*—(13) Falkland Islands Dependency; (14) Ross Dependency; (15) Shackleton dash toward Pole; (16) Scott dash to Pole (1912); (17) Coats Land; (18) Enderby Land; (19) Kemp Land; (20) Queen Mary Land; (21) Wilkes Land; (22) King George V Land; (23) Oates Land. *French*—(24) Adélie Land.

of oil. As many as sixteen whales have been captured in one day off the Cape of Good Hope, and there is danger that the great creatures may be entirely wiped out. But so long as there are millions of square miles of Antarctic ice they can find refuge in waters too difficult and dangerous for even the best equipped ships. That terrible animal, the killer whale, has no commercial value. This creature is fully twenty feet in length and without doubt the fiercest and hungriest of all things that live in salt water.

Both land and sea in Antarctica are hazardous places for man, and the terrible temperatures, the awful storms and the tremendous masses of ice forbid any possibility of settlement, although Great Britain has established the Ross and Falkland Dependencies as a means of controlling the whaling industry and possible mineral deposits. In the far future the climate may change and become as mild as it was once ages ago, but until that happens the great southern continent of ice and snow must remain desolate.

THE SCATTERED NATION

A People Who Have Had No Homeland

The idea of a nation usually carries with it the possession of a particular piece of territory by people more or less similar in origin, language and customs, with an independent government. Yet history tells us of one people who have preserved their identity for over 1,800 years without a homeland, and without any political organization. Normally, in the course of time, a minority is absorbed into the main body of the population of a country, but the Jews who live in every country in the world, and have been in a minority in all of them for centuries, have preserved their identity even though they may be patriotic citizens of the countries in which they live. There are now between fifteen and sixteen million Jews in the world, probably more than at any previous time. Elsewhere we tell of the project of making in Palestine a "National Home" for the Jews, but this article deals principally with the Jews who are now living in other countries.

WE have now covered the whole of the earth in the pages of this work. We have told you not only of the great nations and their inhabitants but also of many small divisions of these nations. We have even told you of insignificant groups who hold some tiny bit of land, perhaps an island, and have shown you how they live. Europe, Asia, Africa, Australia, the Americas and the islands of the sea have been described in text and picture.

We have, however, said little of one people, considerable both in numbers and in achievement. Once they had a country of their own, but for hundreds of years they have been scattered to the uttermost parts of the earth, and yet they have remained a distinct people without losing themselves in the land of their adoption. Many of us have ancestors who were Germans, Irish, English, Scotch or Dutch. and yet we may not feel that they mean anything in particular to us now, a hundred years, perhaps, afterward. It is not so with these people—the Hebrews, commonly called the Jews.

There is hardly a country in the world where there are no Jews. Often they have lived in a city for generations, speak the language fluently, own property, engage in trade and commerce, belong to one or another of the learned professions, or even hold high office in the state, but, in spite of all these, they have kept their identity. Some, to be sure, have lost their faith, have intermarried with outsiders, and no longer call themselves Jews; but on the earth there are still fifteen million Jews, and more. Their story is unique in history. In every other case we know the minority has finally been absorbed, as were the Germanic invaders of Spain, the Normans in England, or the Dutch in New York. This has not happened with the Jews.

In the story of Palestine we have told you something of the early history of these people—how wandering tribesmen from the Arabian Desert made their way northward, conquered a foothold in the better lands, became agriculturists, fought to protect their farms, chose a king to lead them, but Saul, their king, went down to defeat. The third king, David, was able to build a state. His son, Solomon, strengthened the royal power, and built the Temple of Jehovah.

The story of the division of the kingdom after Solomon's death, the civil wars that ensued and the bloody battles is too long to tell. Then the ten tribes of the northern kingdom were deported to Assyria, and probably merged with the surrounding population, though there have been many attempts to explain what became of the "Ten Lost Tribes of Israel." Some have suggested in sober earnest that they were the ancestors of our North American Indians, or of the Japanese.

The southern kingdom of Judah existed a hundred years longer, when many of the inhabitants were taken to Babylon. Seventy years later, we are told some of

the exiles were allowed to return to Palestine, and again they set up a kingdom in Jerusalem.

There were only a few of them, and their state was too weak to resist the conquerors—Macedonian, Egyptian, Syrian, Roman. While under Roman rule, a young Jew called Joshua, or Jesus, of Nazareth, began to preach to the people and gained a considerable following. He offended both Jews and Romans and was put to death, but his followers insisted that he was the Messiah, the Son of God, and continued to preach his doctrines. Soon his disciples were called Christians, and their number increased rapidly.

The Roman rulers were tyrannical and the Jews revolted. After a bloody war, Jerusalem was taken in 70 A.D. It is said that over a million Jews were killed, and nearly a hundred thousand were sold as slaves. For years little bands of outlawed Jews in Palestine kept up the struggle but finally all resistance was stamped out about the year 135. All of Judæa was laid waste, and no Jew was allowed to enter the new city founded on the site of Jerusalem.

The Jews Begin to Wander

Long before the destruction of Jerusalem, however, the Jews had begun to wander. There were Jewish colonies in the great cities of the world, as Rome, Athens, Antioch and Alexandria, where the Jewish philosopher Philo lived, but now these colonies were increased by the exiles from Judæa, who wandered ever farther. Some even reached China. As the years passed little settlements of Jews grew up everywhere. At first they seem to have been little persecuted, but as Christianity spread, the Jews were held responsible for the death of Jesus and they were severely persecuted in many countries, though in others they were either not seriously molested, or else were able to buy toleration.

In the Moslem world, Jews were treated with more consideration. This was particularly true in Spain during the period it was ruled by the Moors. Jews were important in every field. They were landed proprietors, financiers, physicians, statesmen and scholars. Some grew enormously rich and patronized the arts. Many professed conversion to Christianity, and there was considerable intermarriage with the nobility and the higher classes. Such were usually called Maranos.

Jews on the Mediterranean

When the Moorish power declined, and Christianity became the dominant religion, many Spanish Jews took refuge in the growing Turkish Empire and settled along the eastern Mediterranean and in Asia Minor. During the World War many Americans were surprised to learn that the Jews of Salonica, and the Mediterranean regions generally, spoke an archaic Spanish called Ladino. These Spanish Jews were called Sephardim, from the Hebrew word for Spain.

Perhaps the most famous Jew of the Moslem period was Rabbi Moses Ben Maimon, better known as Maimonides, scholar, teacher and philosopher. Born in Spain, he lived for several years in Fez, but spent the latter part of his life in Cairo, where he was physician to the great Saracen leader Saladin. He wrote upon many subjects, but is best remembered for his codification of the Talmud and his Guide for the Perplexed, a study of the philosophic bases of Judaism.

Jews and the Crusades

While the Jews were prospering in Moorish Spain, their lot in most other countries of Europe was hard. The religious excitement of the Crusades, combined with greed for Jewish possessions, led to much harshness toward them. Many were put to death. When the rulers found, as they often did, that they needed the financial ability of the Jewish merchants and traders, a period of toleration followed until something occurred to arouse another wave of prejudice. Thus the Jews were alternately tolerated and persecuted in France, England and Germany.

In Western Europe they were usually forced to live in a special quarter of the

town called the ghetto, often surrounded by high walls with gates which were locked at night. Sometimes the ghetto was so small that two or more families were compelled to live in one room. In Frankfort at one time four thousand persons were forced to live in fewer than two hundred houses of ordinary size. When on the streets of the city they were compelled to wear a conspicuous colored badge sewed to their clothing which marked them as Jews as far as the eye could see.

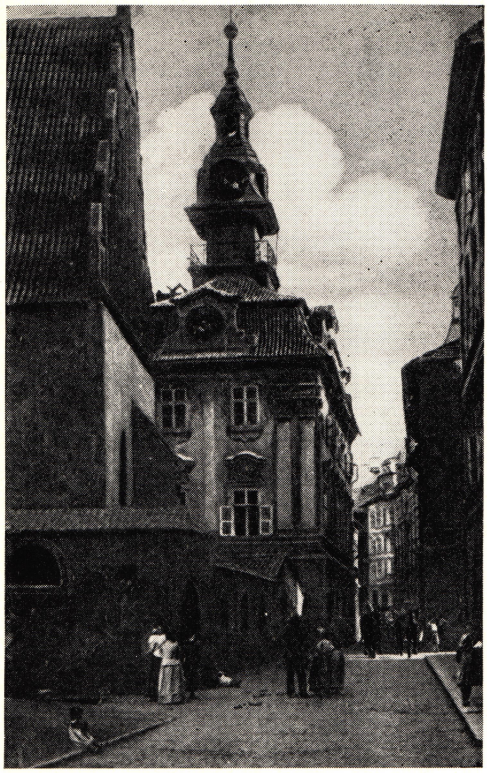
We have already mentioned that many Jews in Spain professed conversion to Christianity. Many of these remained Jews in their hearts, and the power of the Church was turned against them. In 1480 the Inquisition was established to detect and punish these and other heretics. Many of these Maranos, as they were called, were put to death, and their property confiscated. In 1492 all unconverted Jews were expelled from Spain, while the Inquisition continued to search for the secret Jews. Many escaped to Holland, then the most tolerant country in Europe, where they prospered. Baruch Spinoza, the great philosopher, was of this stock.

There was no unified Germany in the Middle Ages, but each petty state, and many cities, made their own laws. Some tolerated the Jews, though with many restrictions. Finally most of the cities and states expelled them and thousands went to Poland, which was glad to receive them. The Hebrew word for Germany is Ashkenaz and so they came to be called the Ashkenazim, as distinguished from the Sephardim, the Spanish Jews. They carried the German language written in Hebrew characters with them to Poland. In time it lost most of its inflections, and many Polish and Hebrew words were adopted into the common speech, which came to be called Yiddish or Jargon.

In the course of centuries the condition of the Jews in Western and Eastern Europe was reversed. Following the ex-

TREASURES FROM THE TEMPLE AT JERUSALEM

This panel in relief on the Arch of Titus in Rome is an historical record of the seven-branched candlestick, the table of gold and the trumpets of silver, taken from Jerusalem at the time of its capture in 70 A.D. After gracing the triumph of Titus, these relics of the temple had several centuries of wandering before finally disappearing.



THE JEWISH RATHAUS AT PRAGUE

This old town hall, rebuilt in 1764 after a fire, is still the administration building for the Jewish community. The clock has Hebrew characters and runs from right to left.

ample of Holland, the nations of Western Europe gradually relaxed their restrictions upon the Jews, and allowed them to settle and follow their callings with increasing freedom. Since the French Revolution the lot of the Jew legally and politically has improved enormously in the West. On the other hand, in Poland, even before independence was lost, the condition of the Jew was no longer satisfactory. When Poland was finally divided among Austria, Prussia and Russia, the largest number of Jews fell to Russia, and during the nineteenth century they were treated with increasing harshness, even up to the downfall of the Empire.

Life in the ghetto had turned the eyes of the Jew inward. He pored over the Talmud and wrote commentaries upon it, and then commentaries upon the commentaries. The proper way of performing every act was set down in the greatest detail, and the effort was to bring about a perfect uniformity.

When the Western World, about the end of the eighteenth century, began to grasp the idea of tolerance, the Jew responded at once, and when the ghetto walls were broken down, a few Jews came trooping through. Perhaps the most important of these was Moses Mendelssohn (sometimes called "the third Moses"), whose ability and sweetness of disposition won him the respect and friendship of some of the leading literary men of Germany. In fact he is the hero of Lessing's drama, Nathan the Wise. In 1783 he published a translation of the Scriptures into good German, and himself wrote a commentary, endeavoring to give a simple explanation of the difficulties in the way. He wrote several important philosophical works as well.

The followers of Mendelssohn, however, were not satisfied. They began to attempt to determine what was fundamental in Judaism and what was less important, and Reform Judaism was born. Much of the Talmud and the commentaries was rejected as not applicable to modern life. The dietary laws were modified, the service was shortened and conducted partly in the language of the country, mixed choirs were introduced, and families sat together in the synagogues. The movement spread into every country where there was comparative freedom for Jews.

Not all Jews accepted the changes however. The great mass of the Jews in Eastern Europe clung to the old ways, but slowly they have made some concessions until we may recognize a third group of Jews. Perhaps we might class the Jews to-day as Orthodox, Conservative, and Liberal or Reformed.

We have already spoken of the persecutions of Jews in Eastern Europe during the nineteenth century and the first years of the twentieth. Hundreds of thousands fled, seeking refuge in Western Europe, in South America, Australia or Canada, but especially in the United States, to which about a million came between 1881 and 1905. All the great cities developed

From Picart's Ceremonies and Religious Customs in the Various Nations

THE SYNAGOGUE OF THE PORTUGUESE JEWS AT AMSTERDAM

Jews from Portugal who, in the latter part of the sixteenth century had fled from their homeland because of persecution and taken refuge in Amsterdam, built this fine synagogue, which is still a centre of worship. The lower picture commemorates its dedication in August, 1674—a celebration that occupied eight days. Both views are reproduced from old prints.

Jewish quarters. The Spanish and German Jews, whom they found in the country had prospered, but the newcomers were desperately poor and were handicapped in many ways.

The Zionist Movement

Though the Jews in Western Europe had gained equality in law before 1900, discriminations of various kinds still persisted. The idea that the Jew would never be free until he had a state of his own was born. This argument set forth by Theodor Herzl, a journalist, in his book, The Jewish State, attracted wide attention, and we now begin to hear of the Zionist movement which gained in strength. In 1917, the British Government announced the intention of facilitating in Palestine "a National Home for the Jewish people." The idea was approved by the League of Nations, which ratified the British Mandate over Palestine, and you are told something of what is being done in the chapter on that country.

It is not expected that all the Jews will go to Palestine. There are now nearly sixteen million Jews in the world, and Palestine, even when fully developed, cannot support a large fraction of that number; but it is to be a rallying point, a centre for Jewish culture and Jewish aspirations, a home for the Jewish spirit.

Where the Jews Live

Meanwhile what of the Jews elsewhere? Of the fifteen or sixteen million Jews in the world, more than half live in Eastern and Southeastern Europe. According to Dr. H. S. Linfield, of the American Jewish Committee, there are nearly 3,000,000 in the new Poland and about the same number in Russia. Rumania has over 900,000, Hungary about 475,000, and Czechoslovakia and Austria about 350,000 each. Lithuania has more than 150,000, and her neighbor, Latvia, something less than 100,000. Greece has about 125,000, European Turkey around 120,000, Yugoslavia about 65,000, and Bulgaria nearly 45,000. The number in the other Eastern states is small.

Though the lot of the Jews in Eastern Europe has improved since 1900, their condition is by no means satisfactory. In spite of the attempts of the League of Nations to protect the rights of minorities, there is still discrimination of one sort or another in many states. It is from these regions that the main immigration into Palestine has gone.

Strange to say, though England and France were among the first countries to give Jews equality before the law, in neither country is the number so large as might be expected. In England, Scotland and Wales there are about 300,000. Many are well-to-do, and some are very wealthy. Several have been raised to the peerage, and one, Earl Reading, has been Lord Chief Justice of England and Viceroy of India. Others have held high positions in the government. French Jews also have prospered, though the number of scholars, authors and scientists is larger than the number in the public service. There are about 200,000 Jews in France.

There are upward of 600,000 Jews in Germany, and this number includes many scholars, authors, journalists and scientists, though the number of successful business men is also large. There are few Jews in the Scandinavian countries, or in Spain or Portugal. Belgium has about 45,000, and Italy about 50,000, while there are 20,000 in Switzerland. In the Netherlands there are about 150,000, many of whom are descended from Spanish Jews who arrived four hundred years ago.

Jews in the Near East

Jews are scattered among the Arabs in all the countries of the Near East, in Palestine, Arabia, Iraq, and Syria, perhaps over 300,000 in all. There are nearly a quarter of a million in Central and Northern Asia, and a few in the Far East. There are about 22,000 in India, and perhaps 12,000 in China. Some of these latter are Chinese in appearance.

Though there are 62,000 Jews in South Africa, there are many more in North Africa—over 400,000—in Algeria, Morocco, Tunis, Egypt and the Italian possessions—all of which were once part of

MCLEISH

THE WAILING WALL of the Jews in Jerusalem. This famous wall, the lower portion of which consists of huge stones, is believed to stand on the site of Solomon's Temple, and hither come Jews from many countries. They kiss the stones and weep, lamenting the destruction of the Temple and praying for the return of their people to the Promised Land. The first Temple of Solomon was burned by Nebuchadnezzar; a second was also destroyed, and the third was destroyed when the Romans captured Jerusalem in 70 A. D. after a long and terrible siege.

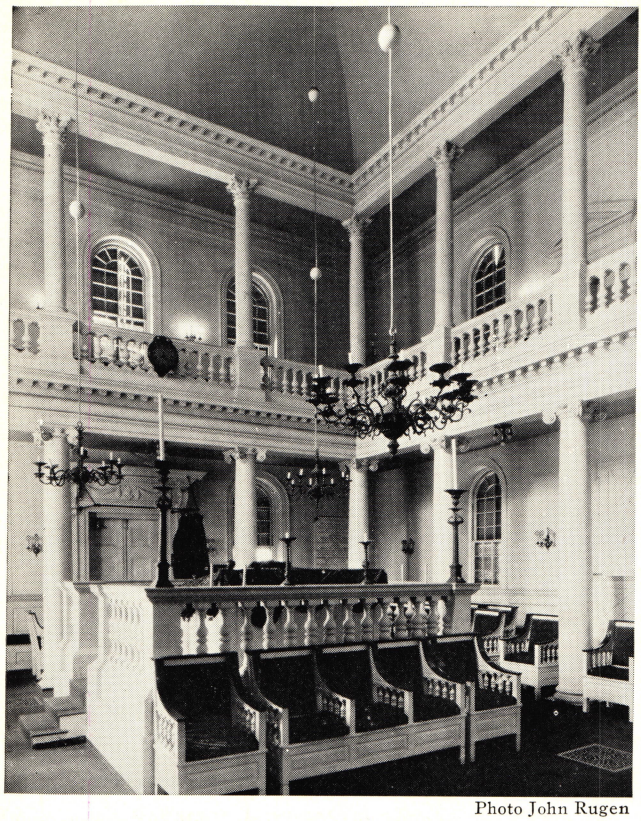


Photo John Rugen

AN HISTORIC SYNAGOGUE IN NEW ENGLAND

This beautiful colonial interior is that of a synagogue, said to be the oldest in the United States, in Newport, Rhode Island. It was dedicated in the year 1763. The tablet shown is in memory of the Touro family.

the great Mohammedan Empire. There are perhaps 50,000 Falashas or "black Jews" in Abyssinia, though little is known of them. Comparatively few Jews are found anywhere in Australasia except in Australia where there were over 21,000 in 1921. The commander of the Australian forces in the World War, Sir John Monash, was a Jew.

Except in Argentina (200,000) and Brazil (30,000), the number of Jews in South and Central America is small. In fact the modern Jew has not been attracted to the Latin-American countries. Except in Cuba and Jamaica, the number in the West Indies is likewise trifling. There are something like 16,000 in Mexico.

In North America proper the story is different. Apparently the first to come were a few of the Sephardim who came from Holland to New Amsterdam by way of Brazil in 1654. Others followed them and a few German Jews as well. Probably there were several thousand at the Revolution, but the great increase was to come later, for the United States has become in recent years, the greatest Jewish country in the world. It is estimated that there were over 4,200,000 in the United States in 1927, and the number is doubtless larger now, as few leave the country. Canada had, in 1931, over 155,000 Jews, most of whom have come since 1900.

Jews in the United States belong, in the main, to three great strains: descendants of Spanish or Portuguese Jews who arrived in colonial or early national times, comparatively few in number; German Jews who began to come in considerable numbers about the middle of the nineteenth century and their descendants; and Eastern European Jews who began to arrive twenty-five or thirty years later, and with their children now form much the largest group.

Though Jews are found in every state in the Union, the American Jew is essentially a city-dweller, and the largest numbers are found in the great cities, as New York, Chicago, Philadelphia and Boston. New York, alone, is believed to have about 1,750,000, or more than one-fourth of the total population of the city. This is the largest number of Jews ever gathered together in the history of the world.

Economically the Jews have prospered in the United States. While, of course, there are many poor Jews, who must toil fiercely for a livelihood, there are also many who have amassed great wealth, and

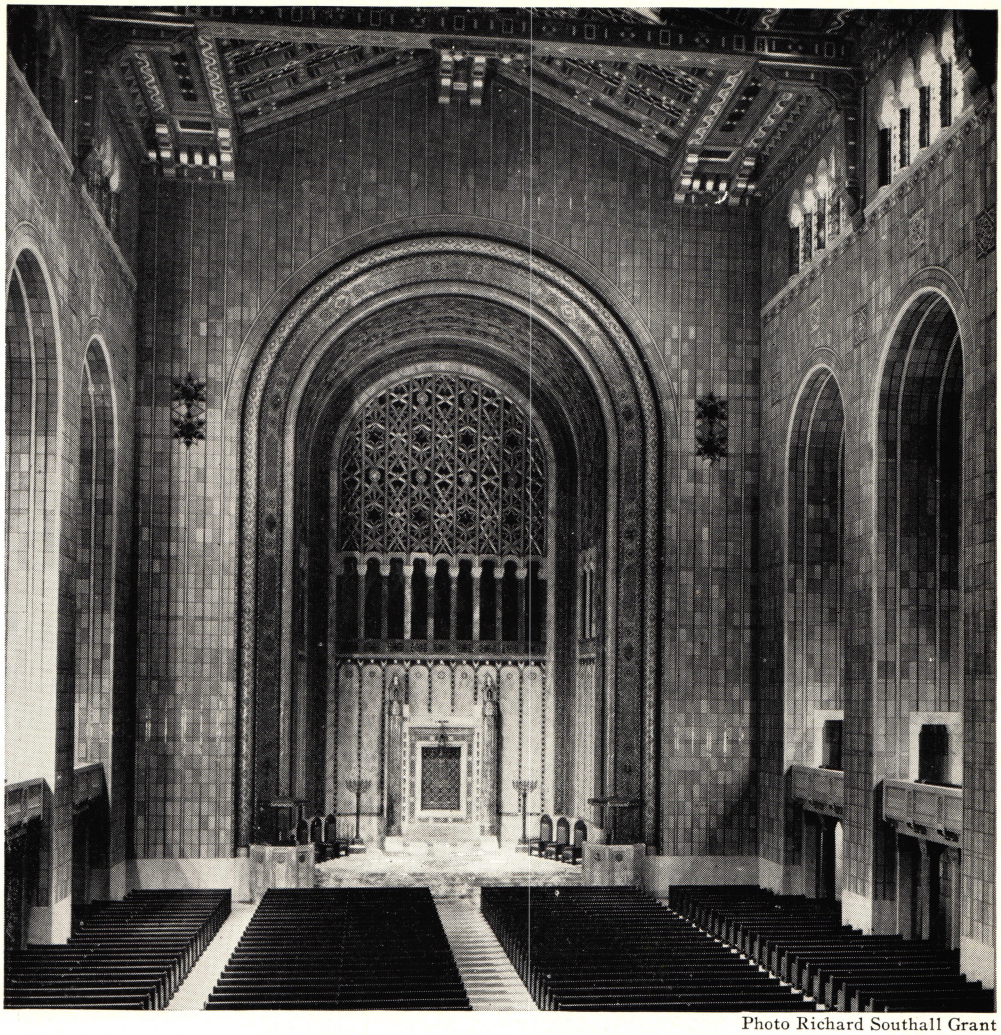


Photo Richard Southall Grant

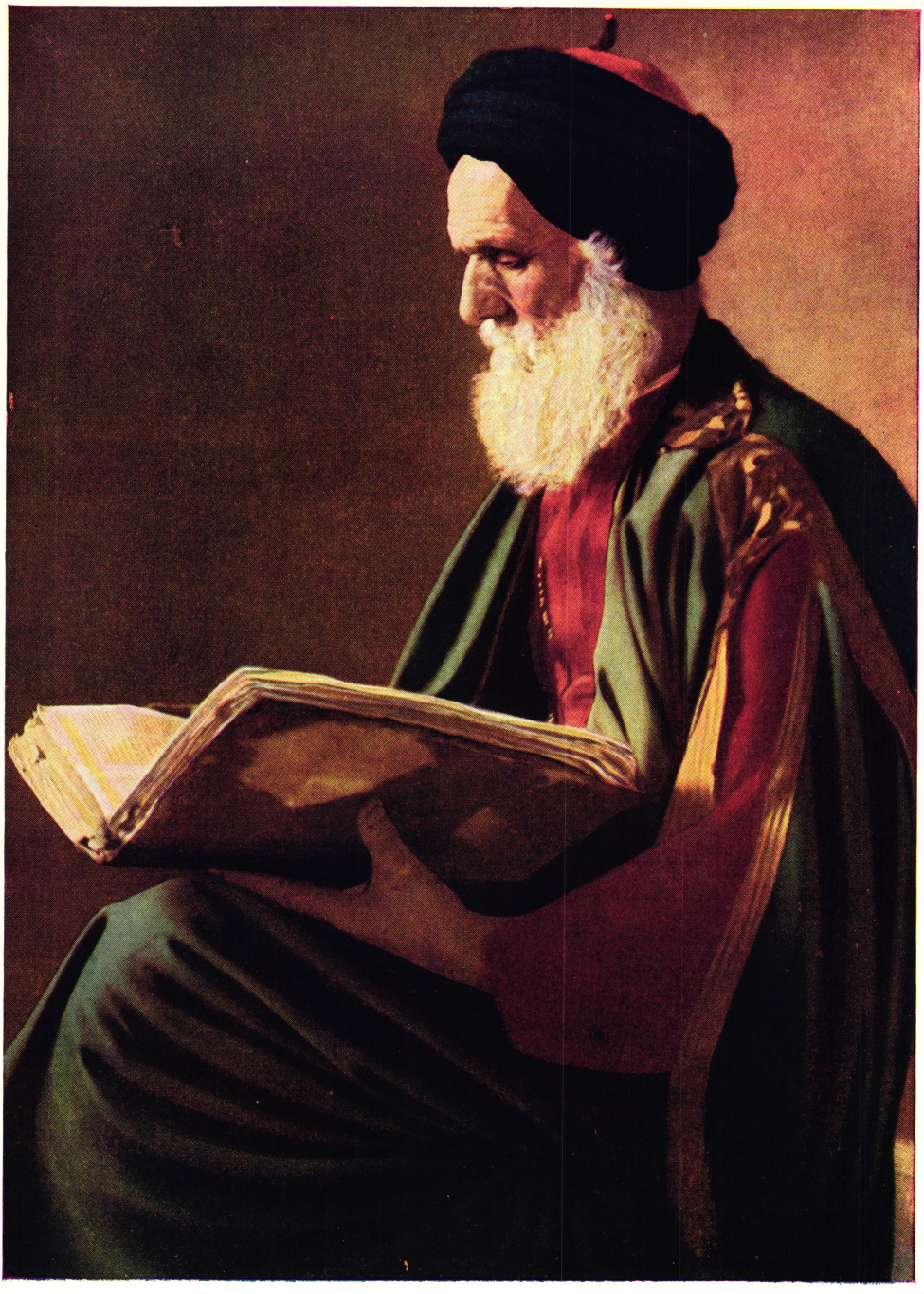
A GREAT MODERN TEMPLE OF THE WESTERN CONTINENT

Temple Emanu-El in New York City, the world's largest synagogue, completed in 1929 at a cost of over $11,000,000 is so proportioned that the impression of size is not overwhelming. The auditorium, 103 feet high from floor to ceiling, will seat 2,800 persons. It is rich in color, to which the tones of stained glass, marble and tiles contribute.

many more who are well-to-do. Many of the important banking houses, department stores, wholesale houses and manufacturing establishments are owned or managed by Jews, as well as a multitude of smaller businesses. They are prominent on the stock exchange, in real estate transactions and in many other speculative enterprises. Jewish men of wealth have made large gifts to educational and charitable institutions.

The Jew in the United States has a positive thirst for knowledge, and is ambitious to enter the learned professions. There are distinguished lawyers, physicians and scientists. Many hold professorial chairs and thousands teach in other educational institutions, or serve as librarians and investigators. They are authors, journalists, dramatists, actors, theatrical managers, critics, musicians, artists and publishers. In short, they have entered successfully into practically every field of intellectual and æsthetic endeavor.

In the public service Jews are increasingly prominent. There are some learned



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THE LAWS OF HIS PEOPLE are studied daily by this dignified rabbi of Tunis, where, as in many other towns of North Africa, there is a large Jewish colony. The Mohammedans, though forcing them to live in separate quarters, have always been more kindly disposed toward the Jews than have other Gentiles. In the French protectorate of Tunisia there are over 60,000 Jews, of whom about 25,000 live in the city of Tunis. The French have provided schools of a special kind for the Jewish children.

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IN THE STREETS OF TUNIS we may see all kinds and conditions of Jews, but few more attractive than this aged rabbi. As in other lands of exile, the Tunisian Jews have a firm hold upon the commerce of the country, and they also act as money-lenders. This occupation has caused them to be despised by the Mohammedans who are forbidden by the Koran to lend money at interest. "Rabbi" is a Hebrew word meaning "my master," and is a term commonly applied to Jewish teachers in every country where they are to be found.

Photo by Burton Holmes, from Ewing Galloway

A BUSY STREET IN THE GHETTO, IN WARSAW, POLAND

During the Middle Ages Jews were forced to live in a particular quarter of a city, called the ghetto, and in many cities have continued to live in a particular section after the old restrictions were removed. Warsaw has had a large Jewish population for centuries, and they have persisted in many customs which set them apart from the general population.

judges, and one, Louis D. Brandeis, has become a member of the United States Supreme Court. Another, Oscar S. Straus, was a member of the Cabinet, and ambassador to Turkey, and there have been several other Jewish ambassadors. Judah P. Benjamin was United States Senator (1852-61) and later filled three different chairs in the Confederate Cabinet. Later he removed to London and became a leader of the English bar. Several others have sat in the United States Senate, and many more in the House of Representatives. The number holding minor national offices, together with those holding state or municipal offices is very large. Jews bore a prominent part in organizing the United States for the World War, and many served in the ranks and as officers.

Such are the Jews to-day. They live in every country, speak every language, engage in every occupation. Economically, they range from the pauper to the multi-millionaire; intellectually the curve rises from the undistinguished to the great scientist whose theories few others are keen enough to understand. The gross materialist and the æsthetic genius may both be Jews. Selfish egoists are found, and altruists who think only of the welfare of others. One is tempted to say that among no other people is the range so wide, and the sum total of accomplishment so great.

What the distant future has in store for the Jews no one can say with certainty. Contradictory forces are working upon them. As the world grows wiser, prejudice diminishes and many Jews who associate freely with Gentiles seem to be losing their sense of separation. Intermarriage is apparently increasing, and the children of such marriages often forget the synagogue or the temple. On the other hand, the Zionist movement has undoubtedly increased the racial feeling, the sense of Jewishness, in others.

RELICS OF ANCIENT MAN

Our Inheritance from Long-vanished Races

Many of the beautiful decorative things of to-day—pictures, statuary, jewelry and splendid buildings—were justly appreciated by peoples who lived many thousands of years ago. There were great artists and craftsmen in very ancient times; and, as the materials in which they commonly worked were enduring, we can still see and admire many of their masterpieces. Some of these are well preserved; others are greatly damaged. They are found all over the world. Sometimes they teach us a great deal about the past; sometimes very little. Many of the very ancient relics were lost to man for thousands of years; they have been restored only through the painstaking work of archæologists. A number of museums now contain collections of ancient art. These include, in addition, replicas of rare objects which the museum is unable to secure, and often reproductions of buildings, monuments, etc. Many Americans have been interested in making collections of Indian remains. They are not extremely old, but they are plentiful enough to give the details of Indian life before white men came to America.

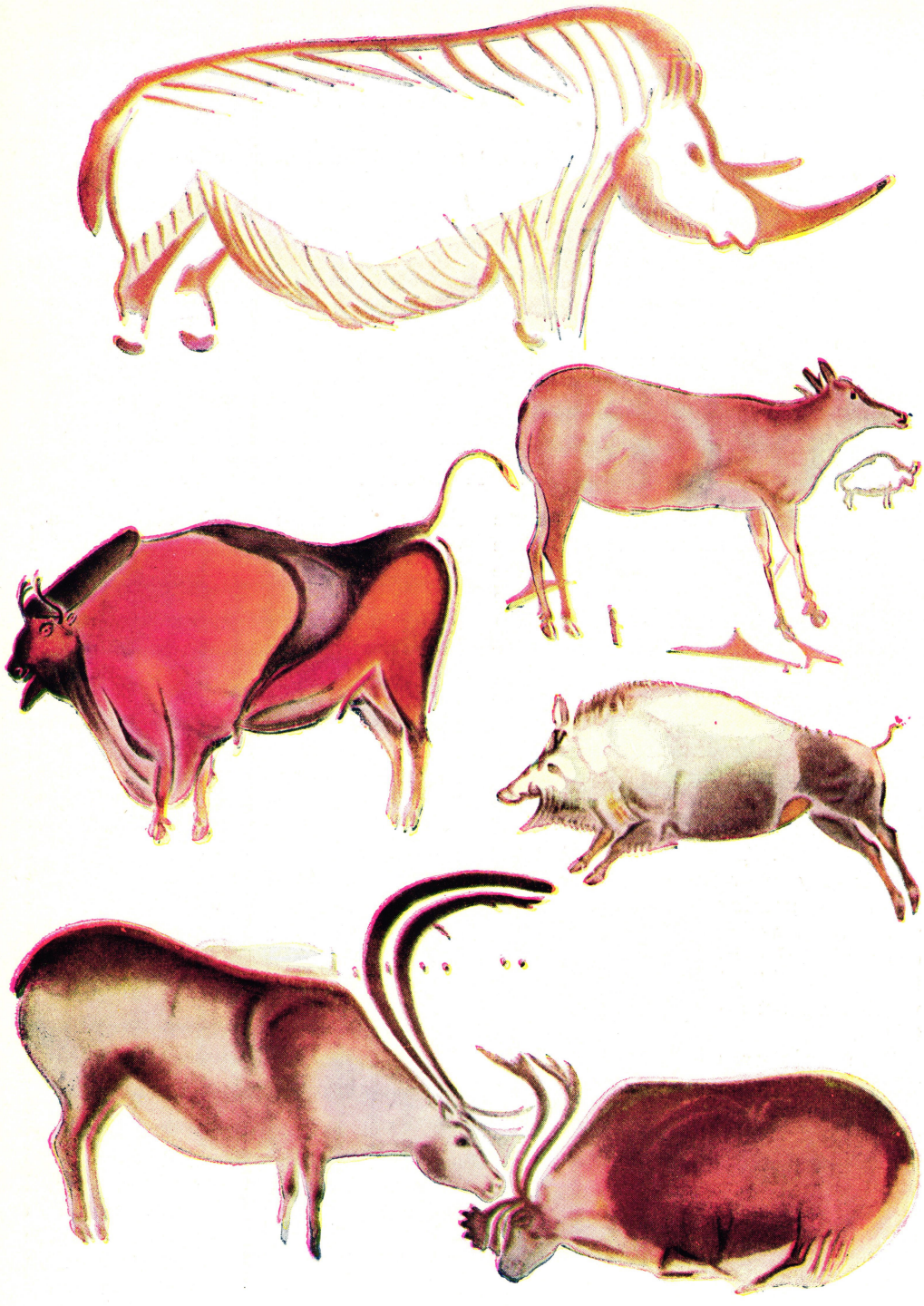
MEN could draw and paint and carve long before they could build. The history of painting is as old as the history of man. During the period known as the Stone Age (over 20,000 years ago) a race lived in southern France and northern Spain who covered the walls of their cave-dwellings with drawings and paintings of familiar animals. A representative collection of these drawings is given on page 224. Excavations in the caves revealed many stone implements and weapons and a number of carved pieces of bone and tusk. These people hunted and fished; they knew the use of fire. But we know nothing about them which can explain the extremely high level which their art attained.

The pictures were first drawn on the walls with a sharp instrument, probably a piece of bone, and afterward color was applied—red, black or gray. At Altamira, in Spain, there are dozens of sketches of bison, wild boars, cattle, deer and horses. These first artists were successful in making their pictures beautifully alive—one bison is charging; another, chewing the cud, and another, raising his head to low. Different species of animals are painted in the caverns of Font-de-Gaume and Les Combarelles, in France. The most interesting are mammoths, resembling elephants, but with shaggy hides and longer tusks; rhinoceroses, with sharp, curving horns and woolly fleeces, and great cave-bears. All of these species are now extinct. Some of the other pictures in these caverns are quite familiar—wolves, reindeer and ibexes. All of these drawings show a complete understanding of the animals' peculiar features and are rendered in a direct, unhesitating manner. The carvings on bone show equal skill. Portraits of wizards are also included in some of these wonderful picture-galleries. In a cavern near the River Ariège, in France, we may see a horrible sorcerer dressed in the skins of wild animals. He wears a

Antiquaries' Journal

STONE AGE ROCK CARVING

Many splendid examples of such carving have been found in caves throughout France, usually on tusks or pieces of bone. It was done during the Palæolithic period of the Stone Age.



MASTER ARTISTS of the Stone Age painted these animals in caverns at Font-de-Gaume, France, and at Altamira, Spain, between twenty and fifty thousand years ago. The accurate observation and forceful rendition make us surmise that they were equally skilled in the art of hunting. The species of woolly rhinoceros is now extinct.

EGYPTIAN ART produced many such bits of sculpture as this some four thousand years ago. A great variety of paintings and sculptures has been found by excavations in tombs because of the Egyptian custom of burying with the dead representations of all that was necessary to carry on a complete life: slaves, animals and utensils.

British Museum

WILD GOATS AND KIDS MARVELOUSLY PORTRAYED BY AN ASSYRIAN SCULPTOR

Here we can see how skillful were the Assyrian artists during the reign of Ashurbanipal in the seventh century B.C. The Assyrian sculptors were the pupils of the Babylonians and, like their instructors, they worked in bas-relief—in figures which stand out from the background. The abundant supply of alabaster and the ease with which it could be worked enabled the Assyrian kings to cover the insides of their temples and palaces with sculptured records of their achievements at home and on the battle-field. These sculptures show us the Assyrian Empire.

mask with goggle-eyes, enormous ears, branching antlers and a long beard. As he danced through the primeval forests he must have been a terrifying sight. Later French artists of the Stone Age carved figures and bracelets of ivory and modeled in clay.

Although we have records of many races passing through a similar state of culture, there has been nowhere else an artistic development which is in any way comparable to that of the Stone Age in Europe.

History Begins

We know that a systematic civilization existed in the Nile Valley between six and seven thousand years ago. Owing to the abundance of wealth, the early development of written records, and the preservative climate, Egypt has well repaid archæological research. The discoveries in that country have been so numerous and valuable that two chapters in Volume V have been devoted to them—Ancient Egypt and Sphinx and Pyramid.

In ancient times the Babylonian and Assyrian empires were among the most enlightened and powerful states of the East. Their great cities stood in the land watered by the Tigris and Euphrates—Mesopotamia, or Iraq, we call it to-day. Control over this region shifted between these two empires during the period from 2500 B.C. to 500 B.C.

Early Culture in Mesopotamia

We owe much to the Babylonians. They invented a system of writing very early—more than four thousand years before Christ. Clay tablets were used instead of paper and a sharp engraving instrument instead of a pen. Education was general among both men and women, and we have to-day many of the texts that were prepared for student use. Their deep interest in astronomy is reflected in the observatories that were attached to the temples and in the development of mathematics, and the invention of the zodiac, the sun-dial, and the crystal lens. The Assyrians were essentially soldiers; their culture was Babylonian in origin.

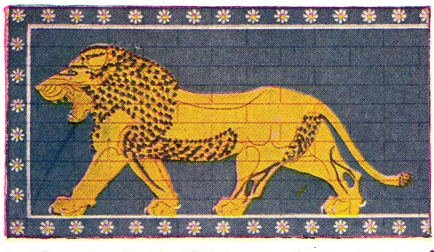
It was in tile-glazing and working in clay that the artists of Mesopotamia, and especially those of Babylonia, chiefly excelled. Babylon was largely built of brick, and decorations had to be suited to this material. Hence tiles were prepared—wonderful enameled tiles of many colors—and methods of painting bricks effectively were evolved. Stone and clay as well as glass were used to fashion lovely vases. Great skill was developed in stone-cutting and jewelry-making. Temple walls were sometimes plated with engraved sheets of bronze or gold in addition to the terra-cotta decoration.

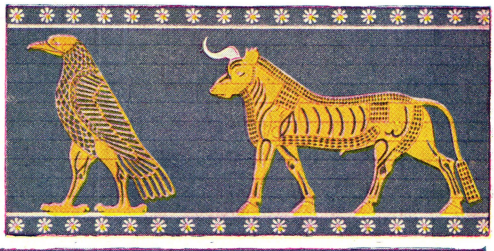
The typical buildings of ancient Mesopotamia were massive and rectangular; the second story was slightly smaller than the first, and the third smaller still, which gave the structures a slight resemblance to pyramids. We may judge of the size and splendor of the old temples and palaces by examining the ruins at Ur of the Chaldees, at Nineveh and at Babylon. Assyria closely followed the example of Babylonia in building, even though another style of architecture would have been more suited to her country. Later, however, the Assyrians began to substitute native stone for brick. This led to the use of carved stone slabs for both walls and floors.

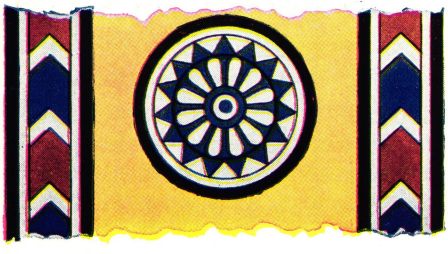
Babylon the Great

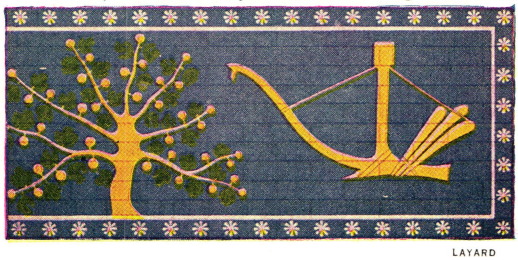
This city, the capital of a powerful kingdom, was perhaps the most beautiful of the ancient world. According to tradition the brick walls which enclosed it were magnificent in size and decoration. Its hundred gates were made entirely of bronze, with carved bronze lintels and posts, and the entire wall lined with hunting scenes, brilliantly executed in enameled tiles. The famous Hanging Gardens were located here as well as many beautiful temples and palaces, including those of Hammurabi, the monarch who codified his country's laws, and King Nebuchadnezzar.

Assur, the first capital of Assyria, was later supplanted by Calah (Nimrud) and Nineveh. It is in Nineveh that we find the fragments of the wonderful palace



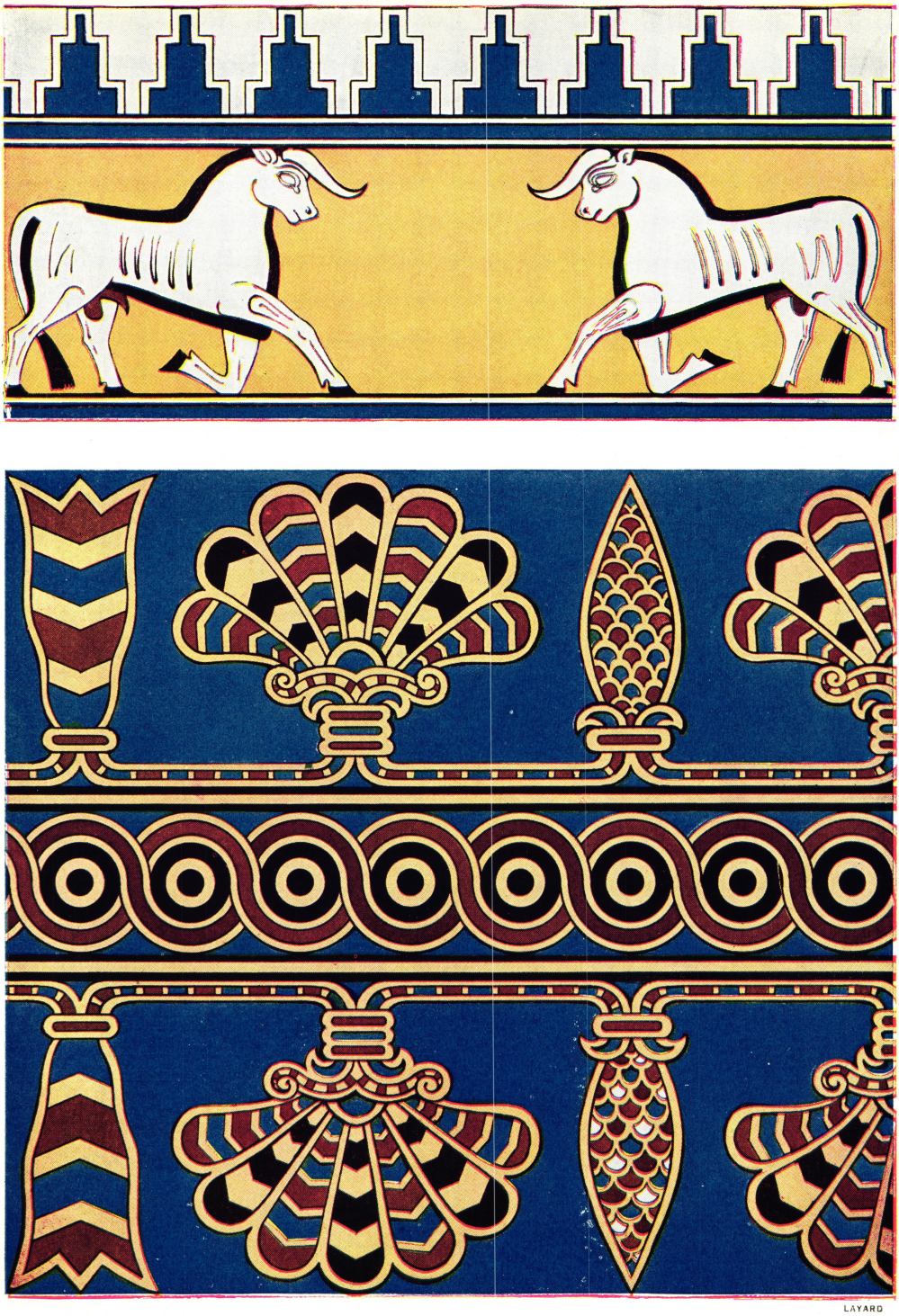






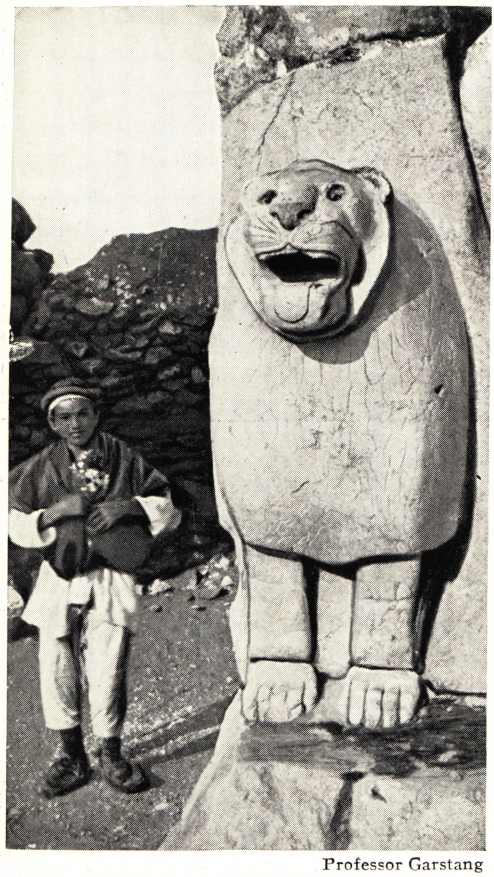
LAYARD

DISCOVERIES OF BRICKS and tiles show the skill of the potter's craft in Assyria. The portion of a brick which shows a king and his court returning from a hunt was found at Nimrud in Mesopotamia. These are representative tiles, both in their yellow and blue coloring and in the decorative treatment given animals and fruit trees.



LAYARD

FROM NIMRUD (the ancient Calah), near Nineveh, came the upper of these two painted bricks. It brightened a palace perhaps 2,700 years ago. It is interesting to compare the treatment of these bulls with that of the animals on page 224. The lower brick shows conventional motifs repeated in a skillful manner to form a frieze.



Professor Garstang

MASTERPIECE OF HITTITE ART

This magnificent lion formed part of a gate which was executed by Hittite craftsmen in the twelfth century B.C. It was found in the old Hittite capital Boghaz-keui (Turkey).

of King Ashurbanipal, whose rule in Assyria began in 668 B.C. Its walls were decorated with descriptive panels, beautifully carved in stone and alabaster or molded in terra-cotta. The kings and attendants of Assyrian sculpture were much alike—men with square, plaited beards, muscular limbs, and the kings wearing elaborate garments and jewelry. In the bas-reliefs of this palace we can see them as they go a-hunting. The panels give a detailed account. In one the horsemen of the king, armed for the chase, are shown galloping past, and we can almost see the horses move and hear the thunder of their hooves so realistic are they.

Lions and lionesses crouch for the spring, or die, transfixed with arrows; herds of wild asses scurry, terrified, before the huntsmen of Ashurbanipal; goats and kids wander peacefully over the plains, as yet undisturbed by sounds of the chase. Then come the bowmen, with nets and hounds, and after them the High King himself, safe in a chariot. Other panels, designed to commemorate the public spirit of the king, give a detailed account of the erection of a great building. They are very interesting in that they furnish us with information regarding the mechanical devices in use at the time. The famous frieze of lions and frieze of archers done in enameled tile which were found at Susa show the strong influence of Assyria in Persian art at this time.

But Susa must have been almost drab compared with Persepolis, the next capital of the Persians. The first palace was built here by Darius about 521 B.C. His son, Xerxes, in the early part of the fifth century B.C., erected the great Hypostyle Hall and the Hall of a Hundred Columns. These were audience chambers, and their size and magnificence testified to the wealth and power of the Persian kings. The Hall of a Hundred Columns was so called because its magnificent roof was supported by a hundred carven and fluted pillars. The walls also were carved, showing files of soldiers and, seated on his throne, the King of kings. On each side of the doorway stood huge statues of bulls, with human heads and wings. The Hypostyle Hall was even more elaborate. It stood upon a great platform of stone and its slender, richly ornamented pillars were sixty-five feet high. The walls, too, were covered with marvelous sculptures.

About these two halls were gardens, in which flowers clustered thickly about pools and playing fountains. Near by were palaces and pavilions, all of them beautiful, all superbly decorated. Could we visit Persepolis, not as it stands today, in ruins, but as it was in the days of Xerxes, we would probably think ourselves in one of the imaginary cities of the Arabian Nights. But its grandeur

has all disappeared; only one pillar of the Hall of a Hundred Columns remains standing.

Before the Persians became powerful, however, yet another great empire flourished and decayed, leaving few traces of its glory behind. This was the empire of the Hittites, a mysterious people who are mentioned in the Old Testament. We know very little about them, except that they appear to have been important in Asia Minor before the twelfth century B.C., that they were powerful enough to challenge the Egyptians and that among them were sculptors of genius.

Their great city, Carchemish, which stands on the Upper Euphrates, abounds in magnificent carvings. There are walls covered with soldiers, animals, monsters and gods. We may see representations of fighting bulls, priests sacrificing a lion, and charioteers plowing through the ranks of their foes. The best of these date from some time after 1200 B.C., when the Hittite empire was on the wane. But among the ruins of their old capital, Boghaz-keui, we may see examples of early Hittite art, which are just as spirited and as fine as anything at Carchemish.

One of the most charming of the tales of ancient Greece describes how a noble Athenian youth, Theseus, went to Crete, to the island of cruel King Minos. There, with the assistance of the lovely princess Ariadne, he slew the fierce monster called the Minotaur, which was half-man and half-bull, and to whom youths and maidens were offered as sacrifices. Excavations in Crete have revealed several interesting palaces which substantiate the details of this legend. The most important palace, at Knossus (Cnossus), covers over six acres. It was undoubtedly built to serve also as a sanctuary. Its winding corridors and passages vividly suggest the labyrinth of tradition, and its numerous wall-paintings illustrate the importance which the Bull (representing the Sun)

Layard

AN EARLY ASSYRIAN ACCOUNT OF THE CREATION

These carvings from the walls of an Assyrian temple illustrate one of the first accounts of the Creation. According to Assyrian legends, the gods chose Ashur to defend them against the winged dragon Tiamat or Chaos. After cleaving the monster, the hero god created heaven and earth out of the halves of her body.

LAYARD

MEN AND GODS were shown with wonderfully full beards and thick hair by the Assyrian artists, so that it is impossible to tell whether this fragment from the ruins of Nineveh represents a priest or a god. This particular type of face is found very often in Assyrian monuments and is distinctly Semitic, such as is seen to-day among Beduins and Jews.

GIRAUDON

ARCHERS OF KING DARIUS have been immortalized in these enameled tiles, now in the Louvre. These were found on the site of Susa, a city which flourished in Persia throughout the period of the Achæmenian kings. The art of making enameled tiles still survives in Persia, even though Susa and the Persian Empire are but a memory.

© Photochrom

STONEHENGE, A PREHISTORIC STONE MONUMENT FOUND ON SALISBURY PLAIN

This monument consists of huge stones placed in two concentric circles which enclose a group of stones arranged to form a double horseshoe, the open part of which faces the sunrise at the summer solstice. Beyond the outer circle stands a huge monolith, the so-called "Friar's-heel" or sun-stone, which marks the place where the Midsummer's Day sun would first appear to anyone standing inside the horseshoe. The plan of Stonehenge, together with excavations in and near it, has created the belief that it was erected by sun-worshipers about 1680 B.C.

had in Cretan religion. The amazing feature of this palace is that it is very much in accord with modern ideas although it was built over three thousand years ago. The staircases connecting the several floors, the plumbing system, the stone furniture and the huge ornamented jars show great skill in both design and execution.

Late Stone Age in Europe

While these great civilizations flourished and decayed in Egypt, Mesopotamia, Asia Minor and Crete, a very different state of culture existed in Western Europe. The people who lived there between 4000 and 1600 B.C. left many remains which indicate something of the nature of their religious life as well as the manner in which they procured and prepared their food. They had considerable culture, for their weapons of stone are nicely shaped and polished and are beautifully symmetrical. The edges of the axes, arrows and spears are surprisingly sharp. They left many monuments —varying from groups of three upright stones to great circles and avenues of bowlders of varying sizes. The isolated groups, or dolmens, were probably used as tombs, the larger groups for religious observances or to form boundary lines.

On the Wiltshire Downs, about seven miles to the north of Salisbury, is the arresting temple of Stonehenge (page 234). It is impressive because of its isolated position and the great size of some of the stones. When one of these slabs, a lintel supported by two other giant stones, fell at the beginning of this century, it required a powerful crane to restore it to its original position. Nobody will ever know how it was first raised, nearly four thousand years ago. It was not until modern times that sufficient study was made of Stonehenge to enable us to believe that it was erected as a temple by sun-worshipers. Before this there had existed many legends as to its origin. The most popular was that it was erected by an ancient king to commemorate some military event or that it was constructed for a Druid temple.

Forests of Stones

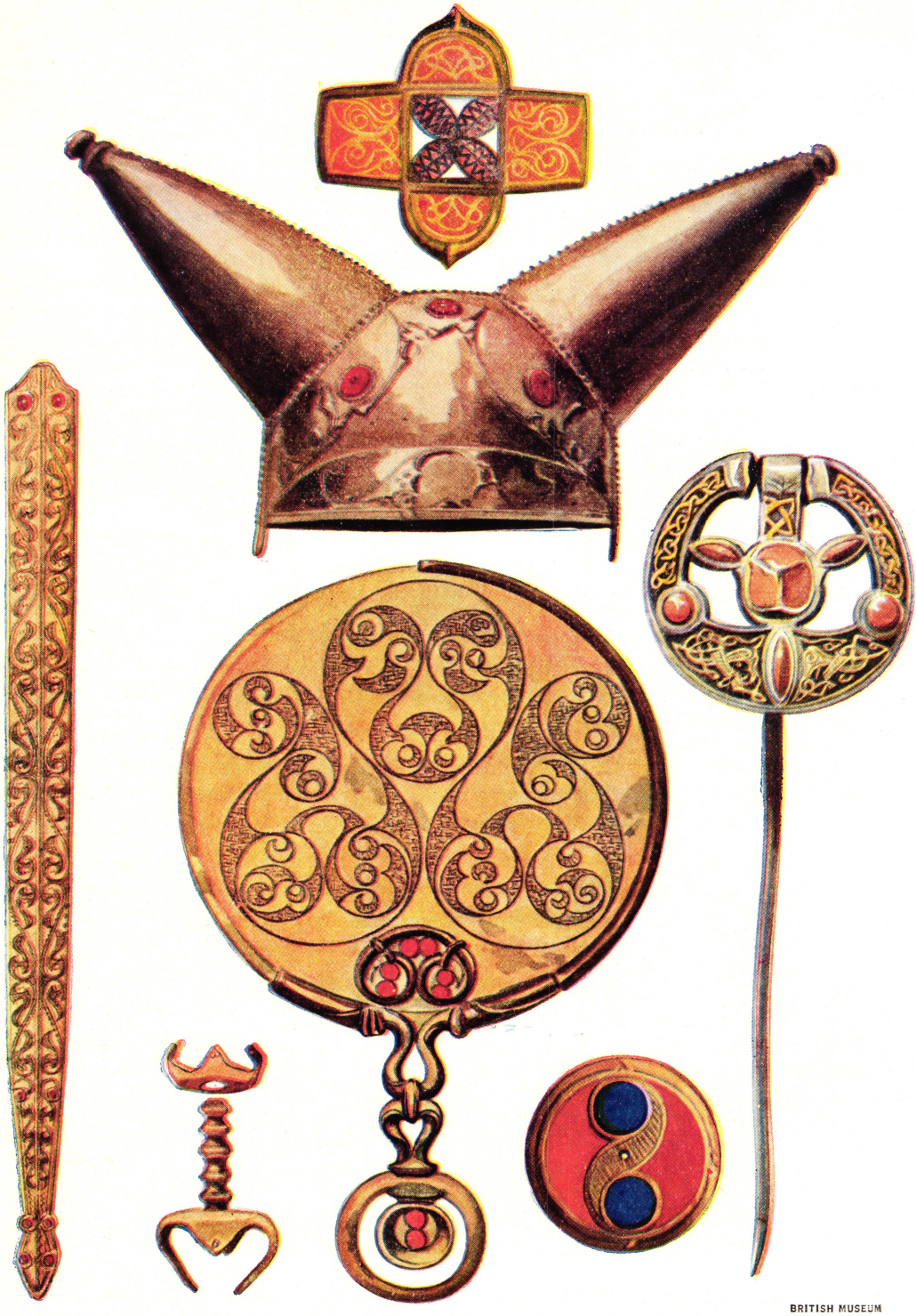
The remains of circles and avenues of great stones are found elsewhere in England, in Berkshire, in Yorkshire, and at Avebury in Wiltshire, for example. They also exist in certain parts of Scotland where it is known that some of them were raised to commemorate military events. In some districts the country folk believe them to be enchanted and haunted by fairies. In Lewes, one of the Hebridean Islands, milk was regularly left in the hollows in the stones as an offering to the "little folk," and this pagan practice only died out in the twentieth century.

It is in Brittany, however, that we see the most amazing works of these ancient builders. Carnac is the centre of a district containing the greatest number of megalithic remains in the world. There are five groups of avenues of upright stones; the largest, at Menec, is like a great forest. Here the stones are arranged in eleven rows, grading in size from thirteen feet to two feet. The next group, Kermario, contains ten lines of stones, and Kerlescan (see page 237) thirteen. The numerous dolmens found in this region were at one time used for burial purposes. Some of the stones found near here are larger than any at Stonehenge. One, called the Fairy Stone near Locmariaquer, now fallen and broken, once measured sixty-four feet. The same type of monument is found in the regions flanking the Pyrenees.

The Celts Discover Bronze

The Celts who lived in Britain about 1800 B.C. were skillful in the manufacture of pottery and simple implements and ornaments of bronze. The work in bronze developed until it produced many exquisite examples such as those pictured on page 236. This pre-eminence in the shaping, embossing and enameling of beautiful weapons was one of the greatest achievements of the Celts.

Monuments of the men of ancient times, as we have said, are found not only in Europe and Asia. In Rhodesia is a mysterious, ruined city—Zimbabwe—



BRITISH MUSEUM

THE CELTS of Ancient Britain developed the art of casting bronze to a highly useful state. The making of bronze swords, daggers, spears and axes was soon followed by ornaments such as the ones pictured. Some of these are exquisitely engraved and enameled and a few are inlaid with semi-precious stones. The use of gold and silver was slight.

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PRIMITIVE STONE MONUMENTS are found throughout France and Great Britain. The ones shown (Kerlescan) belong to one of five groups which have been found near Carnac in Brittany. The stones (menhirs) are arranged by size in thirteen rows. These monuments may have been erected to commemorate events or to form boundary lines.

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THE DOLMEN DE KERGAVAT is another ancient monument in Brittany, one of several pre-historic burial places found near Plouharnel. These dolmens, when complete, consisted of three or more upright stones roofed with a huge slab. They might be circular, oval or quadrangular in shape. Many of the dolmens were at one time covered with earth.

from which King Solomon is said to have obtained his gold. Its high towers and thick walls still stand, but it has no longer any inhabitants.

Both North and South America are rich in Indian relics. Implements of flint and bone have a wide distribution; pottery, basketry, metal-work and weaving are confined to certain areas. When the Spaniards came to the Americas they found two great civilizations: the Aztec in Mexico and the Inca in Peru. The older empire of the Mayas in Yucatan had already begun to decline. Ruins of the Mayan cities show us that their culture was more important in its effects than either the Peruvian or Aztec. Their architectural knowledge was especially sound. The favored plan was to erect a group of buildings (temples and palaces) on a large terraced mound. The successive stories of these buildings were set back, in order to give each a foundation of solid stone. The walls were made of thick stone slabs, fitted together, and profusely decorated with paintings and carvings of symbolic figures. Their interest in astronomy led them to discover the lunar year of twelve months of thirty days about 100 B.C. The spread of this Maya culture formed the basis of many successive cultures in Central and South America.

The Aztecs were great colonizers and empire builders, and they were wise enough to keep the artistic traditions of the tribes which they conquered. The strange and beautiful objects which Cortes sent back to Charles IV were part of the Aztec heritage.

Before the Incas in Peru came into power, the tribes along the west coast of South America had become very skillful in working copper, gold and bronze, pottery-making and weaving. The artistry of workmanship, variety and originality of the textiles is unexcelled. Under the skilled administration of the Incas these abilities came into full flower and fused to form the great Inca culture.

P. H. Edmunds

A HILLSIDE MUSEUM ON EASTER ISLAND

Scattered fragments of a forgotten race are found in profusion about this lonely islet which was discovered by the Dutch admiral, Roggeveen, on Easter Day, 1722. It now belongs to Chile and is sometimes called Rapanui Island. Remains of stone houses and platforms, rock carvings and huge statues present unsolved ethnological problems.

CRAFT, ANCIENT AND MODERN

How Men Navigate River, Lake and Sea

One chapter of the story of man's contest with the elements lies written in the devices by which he has contrived to travel upon the water. Where there have been large trees growing close to a river, primitive man has felled them and made of them dug-out canoes. In Bolivia he has made use of the tall reeds that grow in such abundance, binding them together to make not only boats but crude sails as well. The plainsman of the early days in America crossed the Missouri in a coracle of buffalo hide. The Indian of Northeastern America employed birch bark for his canoe. In the rough waters of Alaska the Eskimo has had to contrive a waterproof kayak. Civilized man has marked off the successive stages of his efforts to overcome space and time by his evolution from the Norse long-boat to the Spanish galleon, the Yankee clipper ship, the wooden and then the iron steamboat and now the racing yacht, the dreadnought, the ice breaker and the oil motor.

SOME few years ago there sailed into Ramsgate Harbor the quaintest little ship imaginable, the Tilikum. She was thirty feet long, but narrow, and drew twenty inches of water, yet had three masts. To look at her, one would have thought her fit only for river or lake; yet in her a crew of two men had sailed forty thousand miles, traveling nearly around the globe.

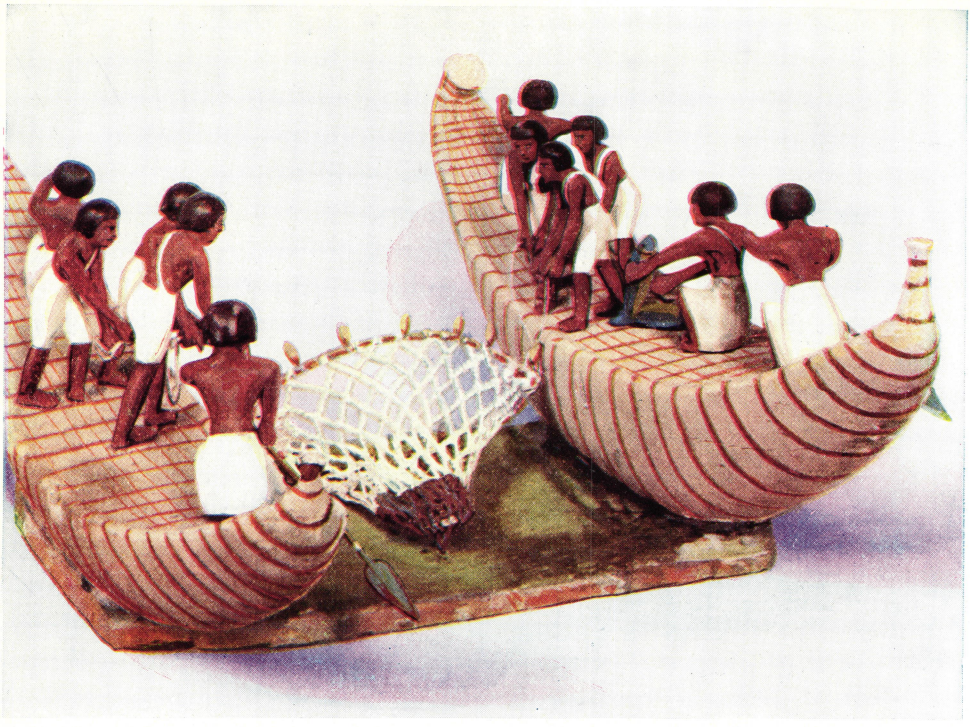
Leaving Vancouver in May, 1921, these two men had crossed the Pacific to Australia, visited New Zealand and thence made their way to Cape Town, South Africa. From Cape Town they crossed the Atlantic to Pernambuco, South America, then, voyaging in an easterly direction by way of the Azores, reached the shores of England. It was a wonderful feat of seamanship because this little two-and-a-half-ton boat was actually nothing but a dug-out—a canoe hollowed from a single huge cedar log by the native Indians of Alaska.

A dug-out is one of the most primitive kind of boats, the kind that man made thousands of years before saws were invented for cutting planks or nails for fastening them together. It will be remembered that Robinson Crusoe, when alone on his desert island, made a dug-out, only to find when he had finished it after weeks of toil that it was too heavy to move. Dug-outs can be made by anyone who can fell a tree and who has tools with which to cut wood or fire to burn it. In the Solomons, a group of large islands lying in the South Pacific, and on the Niger River in West Africa where trees of enormous size overhang the water, as well as along the North Pacific Coast of America, huge dug-outs are launched.

Dug-outs made from a single log are so narrow that they are inclined to capsize, an accident distinctly awkward, not to say dangerous in waters infested with man-eating sharks. It was for the purpose of preventing such disasters that the outrigger was devised. In its simplest form the outrigger was just a long, straight pole or spar of light wood fastened parallel with the canoe. This original outrigger in its roughest form still exists in the Admiralty Islands.

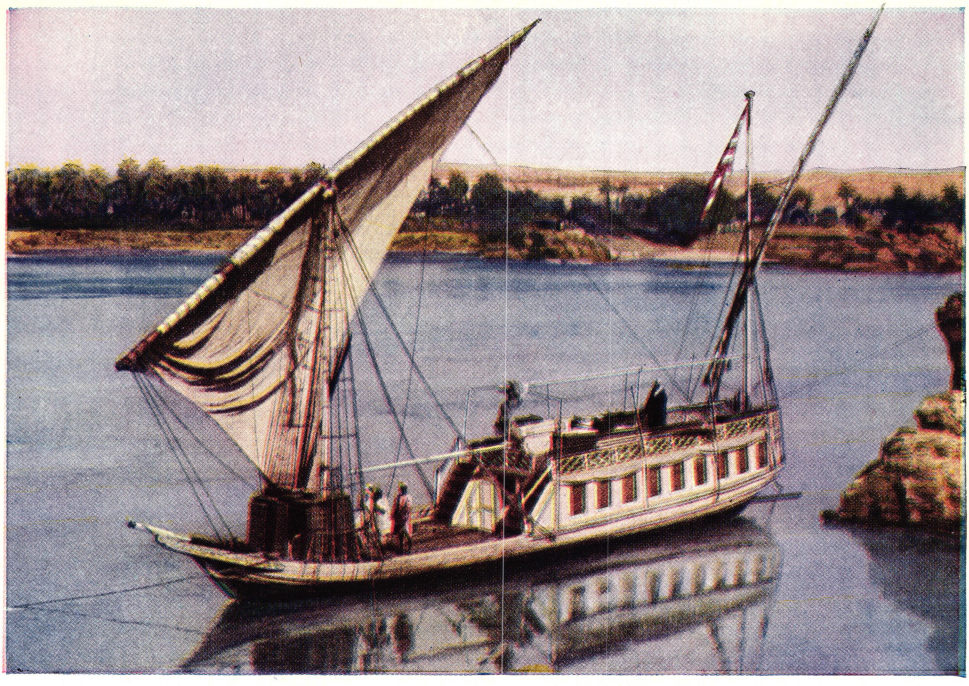
In the Fiji Islands, however, a group of some two hundred islands, the natives rig their dug-out canoes with large triangular sails and fit them with an outrigger on both sides, as illustrated on another page. The people of Samoa, one of the most beautiful of all the South Sea Islands, are still more ingenious, for instead of an outrigger they fasten a second canoe alongside the first, then build a deck over the two and fit it with mast and sail. It was the Samoan double canoe which suggested the wrongly named catamaran, for which there was, at one time, quite a craze among American yachtsmen. This double-hulled boat carried a tremendous press of sail, and on the calm waters of New York Harbor attained amazing speed.

Catamaran is really a Tamil word and



METROPOLITAN MUSEUM, N. Y.

THESE REMARKABLE MODELS, found in an Egyptian tomb four thousand years old, show (above) how the table of a wealthy man like Mehenkwetre was supplied with fish caught in a seine dragged between two canoes with spear-shaped paddles; and (below) how at mealtime the sailors of his traveling square-sailed boat moored the kitchen-tender alongside.



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DAHABIYEHS AND FELUCCAS, are the most familiar boats seen on the Nile. The dahabiyeh shown in the upper photograph is a bargelike houseboat with sails. It resembles the painted galleys on the tombs of the Pharaohs. To-day it is used by tourists and by wealthy natives. The felucca shown below is a swift craft, built of acacia and sycamore.

Capt. F. W. Taylor

MAN'S FIRST IDEA OF A WOODEN BOAT: HOLLOWING A TREE TRUNK ON THE NIGER

Perhaps it was a drowning savage, before history began, who clutched at a floating branch and first conceived the idea of supporting himself in the water. Tree-trunks floating down rivers certainly gave him two of the ideas from which all boats began: the raft and the dug-out canoe. On the River Niger great tree-stems are still hollowed out by burning and then trimmed with some form of adze. In the following pages the history of boat-building unfolds itself in photographs of craft actually built to-day by men in various states of civilization.

American Field Museum

ADMIRALTY ISLAND DUG-OUT FITTED WITH AN OUTRIGGER

It takes a large tree to make a boat broad enough to be stable, and primitive man often has not the means to cope with its felling and hollowing. To prevent the narrow dug-out capsizing the outrigger, a pole fastened parallel to the canoe, was devised. It enables such craft to venture upon the open sea without capsizing.

refers to a rude raft made by the natives of Southern India. It consists merely of three logs of light wood lashed together, the middle piece, longer than the others, being used as a keel. Larger catamarans fitted with mast and sail are employed upon the great Amazon River of South America.

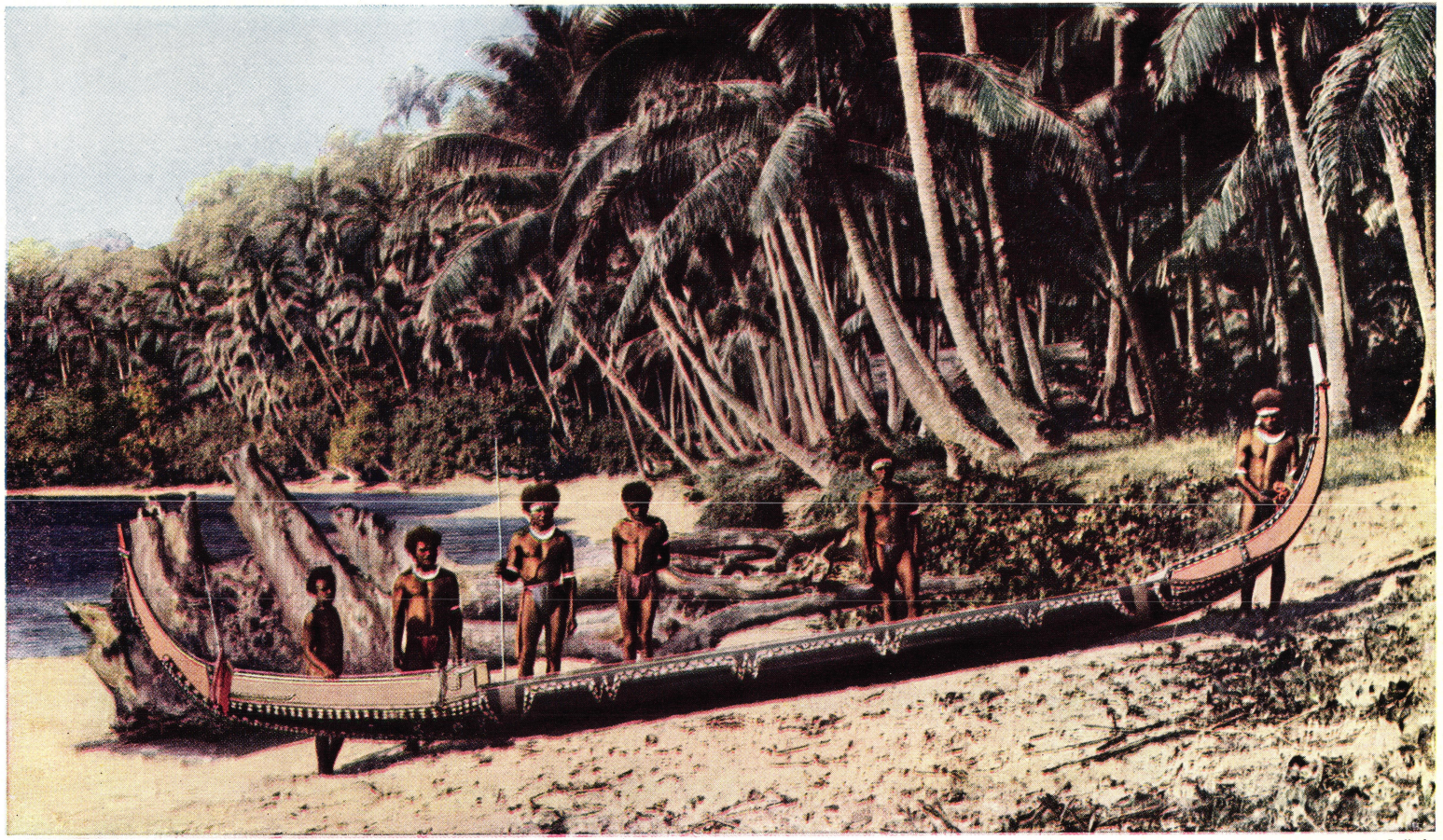
The boat, like the plow, had not one, but many inventors. In the old days whenever a tribe happened to settle near a river, lake or sea, there it devised some sort of boat. At first a log or piece of driftwood would be used to help a man float or swim across a river, then two or three logs would be bound together with creepers to form a raft. Where wood was scarce the first stage would be a wicker frame covered with skins, or, as on the Nile in Egypt, a bundle of reeds tied together. It is thought that perhaps these reed-floats were the first things to suggest the well known shape of a boat, which was afterward copied in wood when the next stage, the dug-out, came to be invented.

The coracle which is still in use on some Welsh and Irish rivers, is one of the oldest forms of boat. The original coracle was simply a large basket of wicker-work covered with the roughly tanned hides of animals, but the modern one is a framework of ash or willow covered with canvas made waterproof with tar or varnish. It is so light that one man can carry it with ease, and although a person who is not accustomed to paddling one finds it difficult to manage, a skilled hand will actually go salmon-fishing in one of these craft.

Such a boat is a common sight on the Tigris and Euphrates rivers in Mesopotamia, but is there called a "gufa." The gufa is built of wicker covered with hides and made waterproof with a coating of bitumen or pitch, springs of which are found welling out of the ground in that country. Some gufas are built large enough to carry sheep and asses.

© EWING GALLOWAY

ON JAVA'S LAKES passengers who are not in any kind of hurry are ferried over in a contrivance which is really more a luxurious raft than a boat. Two dug-out canoes support the platform shown above. Owing to its great resistance to the air, such an arrangement is safe only so long as the passengers keep quiet and distribute their weight evenly. It would be impossible in a high wind blowing at all contrary to the course steered by the paddlers. The Samoan sea-going vessel pictured further on is an elaboration of this idea, with a mast and a superstructure added.



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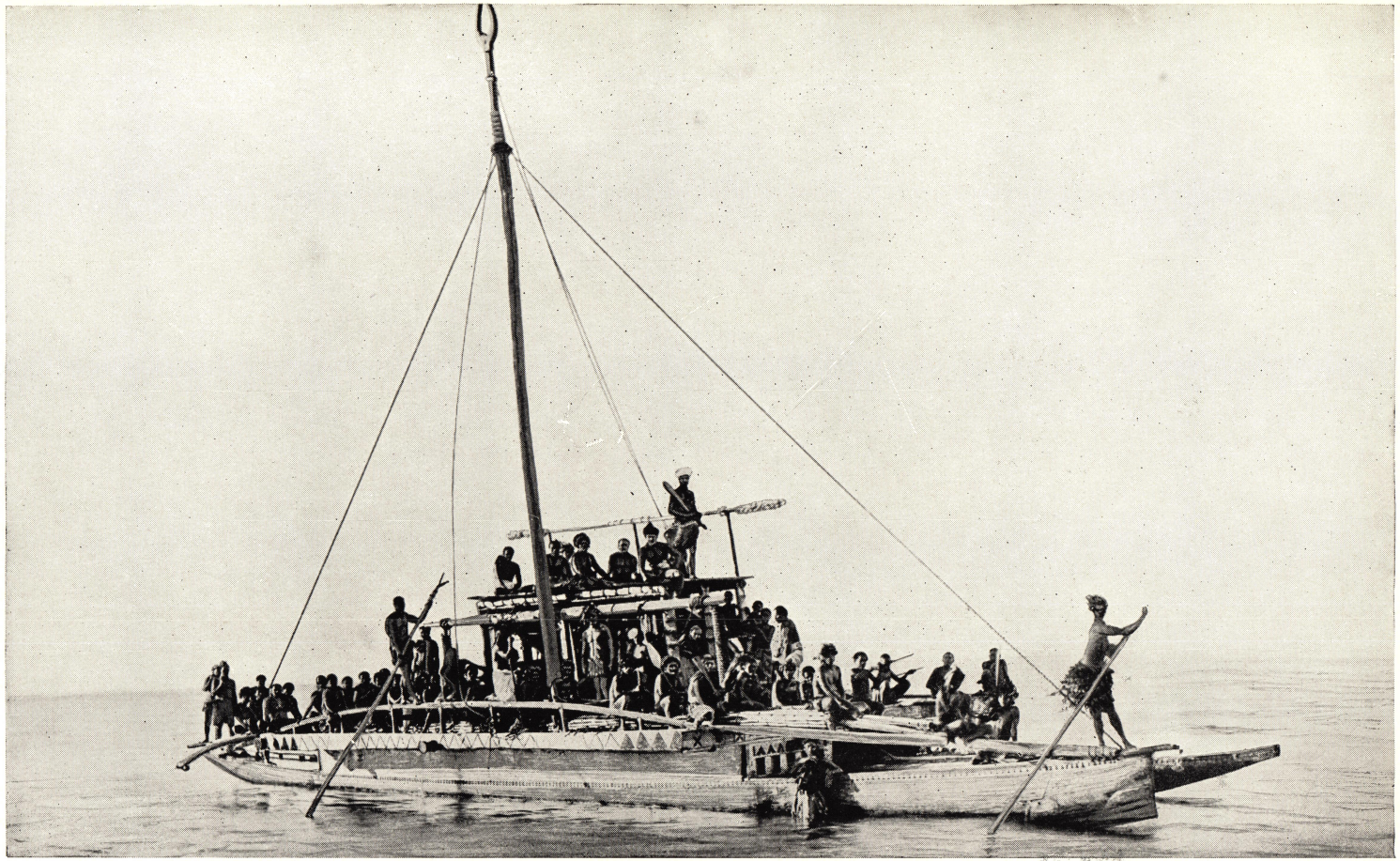
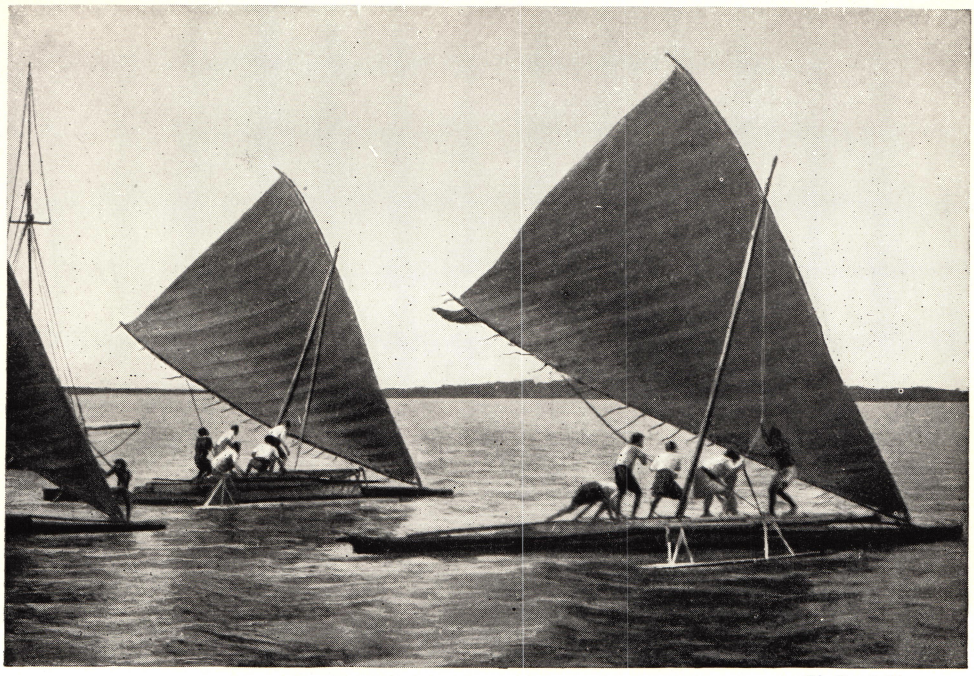
A SOLOMON ISLAND CANOE is a dug-out cut from a single trunk of a palm tree. It has prow and stern built on separately at the ends of the hollowed palm trunks, and a cigar-shaped bottom designed for easy launching. Though easily launched, this craft differs from most Pacific Island canoes in lacking an outrigger, and considerable skill is needed by the crew to prevent it from capsizing. The paddlers kneel in a double row of ten or fifteen, according to the length of the canoe. A highly ornamented gunwale shows that it is a much dreaded war-craft.



© Brown Bros.

TWO DUG-OUT CANOES COMBINED TO MAKE A SEA-GOING VESSEL IN SAMOA

The people of Samoa have ingeniously made a ship by developing their dug-out idea. The outrigger suggested that a second canoe might take its place and so increase accommodation without sacrificing seaworthiness. It then occurred to them to build a superstructure over the twin canoes and equip the resulting vessel with a mast. Long sea voyages have been made in such craft. The prows of the two canoes are plainly seen to be of different shape. Two men with poles are endeavoring, as shown in the photograph, to hold her steady.



Sir Basil Thomson

SAILING FIJI DUG-OUTS IN A CLOSE RACE

Fiji Islanders apply a highly effective sail to their dug-out canoes. As their craft have no keel to counteract the tendency of a boat to capsize under pressure of wind on the sails, they have arranged an outrigger on both sides, on to which men can climb and by their weight prevent the canoe from heeling over too much.

As primitive as the coracle or the gufa is the boat used by the people of Tibet, that chill and lofty mountain land lying to the northeast of India. Here, owing to the great height, there are no large trees such as might be used for making dug-outs. The Tibetans therefore make a raft of logs and build up the sides so as to form a great oblong wooden box. This they cover with yak hides sewed together. In this way they achieve a boat large enough to carry not only men but horses.

For crossing rivers the people of Northern India use what they call a "mussuck." This is nothing but a goat skin sewed up and blown full of air. It looks horribly like a dead animal, but is light and buoyant. The native sits astride the mussuck and works it with a paddle.

Another skin-made boat is the Eskimo "kayak." It is made of sealskin stretched over a wooden or a whalebone frame, and is perhaps the smallest sea-going craft in the world, being about seventeen feet long and less than two feet in width. It holds but one man, who uses a double-bladed paddle. Since a mere ripple would suffice to fill and swamp it, the dress of the paddler is joined to the deck covering to make the boat watertight. The Arctic explorer, Fridtjof Nansen, when stranded in the Far North, built for himself one of these kayaks and in it crossed a wide stretch of open water.

For longer voyages and heavier cargoes the Eskimos have devised the "umyak," which is built of driftwood ingeniously pieced and lashed together and covered with hides. Umyaks forty feet long are seen loaded with two or three families and all their worldly possessions. They are usually rowed by women.

As for reed boats, they are still sometimes used on the Upper Nile for crossing the river, and on Lake Titicaca, in Bolivia, a sheet of water sixty miles long, lying at the tremendous height of thirteen thousand feet above the sea. Some beautiful little models were discovered in an Egyptian tomb four thousand years ago which show that this type of boat was originally

HERBERT FELTON

THE GONDOLAS OF VENICE have the distinctive bow found, in some form, in most boats native to the Mediterranean. The origin may have been the ram used on the ancient galleys, though at present, since it is the highest point in the craft, it serves as a sighting post when going under the many low arched bridges. The gondola is purposely built with a twisted stern which acts as a rudder against the pull of the single oar with which it is rowed. The curved rest for the oar is seen outlined against the water on the starboard side. Some motorboats are seen on the canals

a solid bundle of reeds on which one stood or sat.

Thousands of years ago, when the Red Indian first came to North America, he found a country full of swift rivers and roaring rapids. He had to invent a boat fit to navigate rough water, yet light enough to be easily portaged or carried around the falls and from one stream to another. Thus, in the course of ages, he evolved the birch bark canoe which, of all craft, is the swiftest, lightest and most graceful.

Light Canoe of Maine and Canada

The true Indian canoe is made of strips of birch bark fastened over a light wooden frame. The strips are sewed together with the fibrous roots of fir trees and the seams are made waterproof with resin. This canoe is the one savage boat which has been adopted by all civilized peoples, for in spite of its frail look it is wonderfully seaworthy. The so-called Maine canoes are copies of the original craft but with stronger material such as canvas or thin wood to cover the framework. The Octoroon, which was but seventeen feet long and twenty-three inches broad, crossed the turbulent British Channel from Boulogne to Dover in eleven hours.

The Chinese were probably the first people to build sea-going ships of any size, and some say that they invented the mariner's compass centuries before European sailors had any idea of such an instrument. Another important invention of the Chinese was the centre-board, which can be let down so as to project under the keel of a vessel and thus keep it from drifting when sailing across the wind. The Chinese junk still has much the same shape as it had a thousand years ago and clumsy as it looks, with its high sides and square sails, it compares favorably with the craft which our own ancestors used no more than four hundred years ago.

The Long-ships of the Norsemen

The best of the early white ship-builders were the Norsemen. Their long-ships were powerful vessels—large enough to carry even cattle and horses. One of the great Norse song writers, Olaf Tryggvason, has left us a description of a long-ship. It was one hundred and forty feet long, not counting the overhang at bow and stern, and had no fewer than thirty-four rowing benches.

Columbus' flag-ship, the Santa Maria, built five hundred years later, was but sixty-three feet long and inferior in every respect to the fine long-ships of the eighth and ninth centuries. Our photograph shows a duplicate of the Santa Maria that sailed across the Atlantic in 1893.

Ship-building improved rapidly in the days of Queen Elizabeth, in the sixteenth century. The English began to construct fast ships and the Spaniards large ones. The galleons that brought silver and gold to Spain from South America were commonly of one thousand to twelve hundred tons burden, but the English ships, scarcely a quarter that size, possessed the advantage of far greater speed. The great change in the eighteenth century was that frigates came into use, for these were lighter, swifter, more easily managed and better able to beat into the wind.

A Speed Record for 1821

During the nineteenth century, the United States built the first really fast sailing ships. As long ago as 1821, the George of Salem came home to Boston from Calcutta in ninety-five days. At that time British East Indiamen took from five to eight months to make the much shorter passage from London to Calcutta.

In 1845 came the miracle of the Rainbow. This ship, the first of the real clippers, was built with sharp lines, raking masts and a great spread of canvas designed for speed, and her shape was so new that "old salts" vowed she was built against all the laws of Nature. Whereas the lines of the older ships had been those of the codfish, with round bows and flat bottom, this new vessel had her greatest breadth amidships, and at bow and stern narrowed delicately. A crowd

© E. N. A.

POLING A GUFA ON THE TIGRIS

One of the earliest departures from the idea of the raft was the vessel of wicker or other framework covered with hides and daubed in pitch. At Bagdad they are still used. The largest gufas carry a dozen men.

gathered to see her start, fully expecting that she would capsize at the first gust of wind. She sailed in February for China, and was home again in September with a cargo worth twice what she had cost to build. The greatest speed ever recorded of a sailing vessel was twenty-one knots. (A knot is a unit of speed of one sea mile or about one and a seventh land miles an hour.)

Before we leave craft propelled by sails, let us mention sailing yachts, pleasure boats first devised by the Dutch East India Company in the seventeenth century. There are two types—one the racer, with fine lines and large sails, and the other the more commodious cruising yacht. In 1910 the United States sent a racing schooner, the Westward, to Europe, which won each of the eleven races in which she started. In 1911 four cutters of a third the tonnage appeared, and in 1920 a compact racing yacht a third their tonnage (thirty-five tons). A triangular or Bermudian rigged yacht is to-day favored by English sportsmen. Since the World War, the United States has been developing yachting along two lines, that of the small boat no more than fifteen and a half feet on the waterline and that of the durable combination racing and cruising schooner designed for long distance contests.

In the year 1819 the British schooner, Contract, was in mid-Atlantic when her lookout sighted on the horizon a ship apparently on fire. The Contract at once started to the rescue, but when she came nearer her captain was amazed to see that the column of smoke issued from a tall funnel. The strange ship drew rapidly away and soon disappeared. In point of fact, the vessel that had so startled the crew of the Contract was the Savannah, the first ship which ever crossed the Atlantic by steam. It was then but twelve years since the Clermont, the first steamboat designed by Robert Fulton, had startled New York City. Once it was proved that steam could be used for driving ships in the open sea, many firms began to build steamers. The first transatlantic race in which steamers were engaged was in 1829, when the Sirius, a 700-ton ship, left Cork for New York, and four days later the Great Western, of 1,340 tons, left Bristol. Both reached New York on the same day. Nine years later the British government asked for tenders for conveying the mail to America by steam, and Samuel Cunard, a Quaker shipowner and civil engineer of Halifax, Nova Scotia, at once determined to offer. He came to England, got in touch with

Canadian National Railways

BIRCH BARK CANOE RIDING THE WAVES OF RAINY LAKE, ONTARIO

Instead of skins to cover his boat frame, the North American Indian used strips of birch bark. He evolved a type of craft suited to his rivers. When rapids were met they could be shot, or the canoe could be portaged overland to the next smooth water. The canoe favored in Maine and Canada is covered with canvas or built of thin wood.

© A. W. Cutler

ON AN IRISH RIVER: CORACLES AS USED BY ANCIENT BRITONS

It is surprising to find the same vessel in Mesopotamia and the West of Ireland. The coracle was in use over two thousand years ago in Celtic parts of the British Isles, and Cæsar mentions them in the history of his wars. Originally of hides stretched on a wicker framework, they are now made of tarred canvas.

Danish Legation

"KAYAKS" AND A SEALSKIN "UMYAK" OF THE ESKIMOS OFF THE COAST OF GREENLAND

In the largest of these boats we have an example of the Eskimo "umyak," or woman's boat, in which the skin and framework boat reaches its height, not only having proper bows and stern but by being sea-going. The smaller boats are "kayaks," one of the marvels of boat-building. Of wood or whalebone and sealskin, they are completely watertight when the paddler is seated. A favorite trick is to lean over sideways until the boat capsizes, which it does easily, then turn a complete somersault, boat and all.

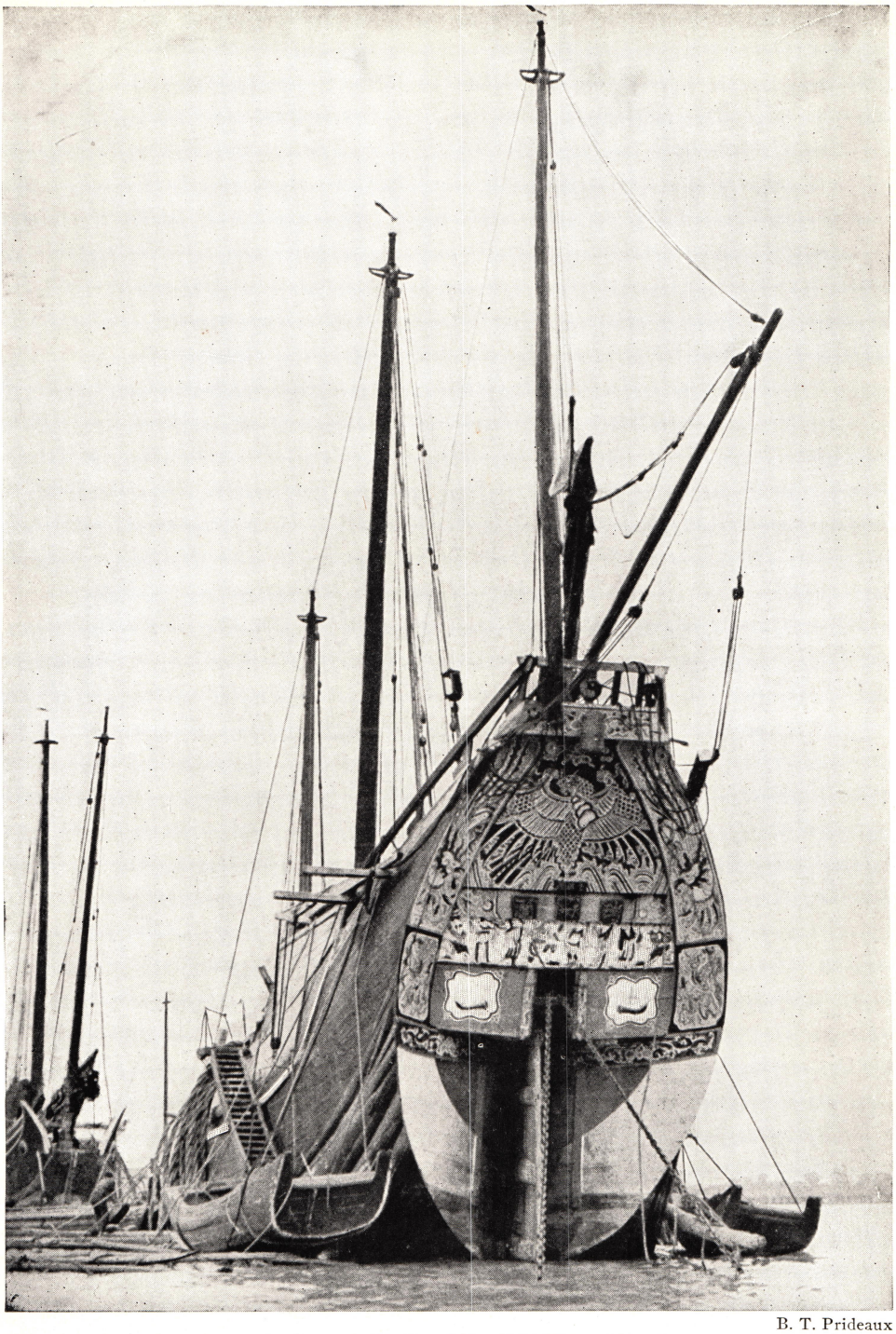
ALL REED BOATS OF THE WORLD'S HIGHEST WATERS

Bundles of reeds or faggots were contemporary with the floating log in boat history, and the reed boat is simply a development upon a framework to give stiffness. The reeds are bound tightly with grass twine, and given the shape of a boat, and reed matting makes an acceptable sail on this mountain lake (Titicaca) in Bolivia.

Sudan Government Railways

NUGGAR OF THE NILE, USED LARGELY FOR FERRYING

The "nuggar," still used on the Nile, is strangely built. No fastenings are visible on the sides, for wooden pins pass vertically through each pair of planks. The seams are calked with pitch but the craft is none the less a leaky one. The rough sail and mast are used against the current, and oars for going downstream.



B. T. Prideaux

CHINESE JUNK: ANCIENT MERCHANT VESSEL OF THE YELLOW SEA

The Chinese were perhaps the first to build sea-going vessels of any size. They evolved a system of navigation and ship design and thought of the centre-board and lee-board centuries before anything of the sort was attempted in the West. Still they have the old-time junk, with its great free-board, matting sails and ornamented stern.

Kenneth Comyn

LATEEN RIGGED DHOW BOUND OUT OF ZANZIBAR FOR INDIA

In this photograph we come to another long-voyage ship, an ancient type that still survives and perhaps originated in the Persian Gulf. It was the principal type of vessel used in the old slave trade. Usually of 150 to 200 tons burden, it carries a lateen or triangular sail, often colored, with an immense yard. Notice the long sloping stem and high stern.

Sir George Burns and David McIver, and the three between them formed the Cunard Company. With a capital of about $1,000,000, they built four steamers of just over a thousand tons each. These were driven by paddle wheels and they took nearly three weeks to cross the Atlantic. The first voyage was made by the Britannia in 1840. Then began the Cunard Line, which still carries the transatlantic mail in vessels aptly called floating palaces.

About this time iron began to be used in place of wood for building steamships. A few small vessels had been built of iron early in the nineteenth century, and one, the Garry Owen, having been wrecked on her first voyage, was found to be still watertight, although wooden ships, wrecked at the same time, were pounded to bits by the waves. In spite of this proof of superior strength, steamships were still built of timber until it was found that the limit in length of a wooden ship was about 275 feet. If built larger it buckled. The only substitute was iron, and what seems wonderful is that the use of iron instead of wood means a saving of at least a third in the weight of the hull.

Steel, being stronger and lighter, gradually took the place of iron. It is said that the first steel steamer ever built was the Ma Robert, constructed in the middle of last century for the great missionary, David Livingstone, and used by him for traveling on the Zambezi River in Africa. The first of the big steel Atlantic liners was the Cunarder Servia, of 7,000 tons burden and nearly 17 knots speed, built in 1881. Ten years later nearly all new ships were being built of steel, and

THE SHIP COLUMBUS SAILED IN

This is the exact duplicate of Columbus' flagship the Santa Maria that was wrecked on December 25, 1492. She was a decked boat of twenty-foot beam and sixty-three foot length.

ever since then the size of such vessels has been increasing, until now we have floating cities of sixty thousand tons.

It was the coming of steam that made modern battleships what they are. The first steam vessels built were all small craft, mere tenders, in fact. The earliest steam fighting ship was the war sloop Rattler, built at Sheerness in 1843, a vessel of just over one thousand tons. She was also the first warship to be driven by a screw instead of paddle wheels. The Admiralty had little belief in the screw, but the builder of the Rattler persuaded the authorities to arrange a tug-of-war with the Alecto, a paddle ship of similar size and power; then, although the Alecto's engines were driven at their full power in the opposite direction, the screw boat towed her stern foremost at nearly three miles an hour.

The first iron warship was built in England in 1842. During the American Civil War of 1860-1865 it was proved that the wooden warship was quite useless and out of date, for the steel ram Merrimac was more than a match for all the big wooden vessels brought against her, though she was defeated by the smaller iron-clad Monitor.

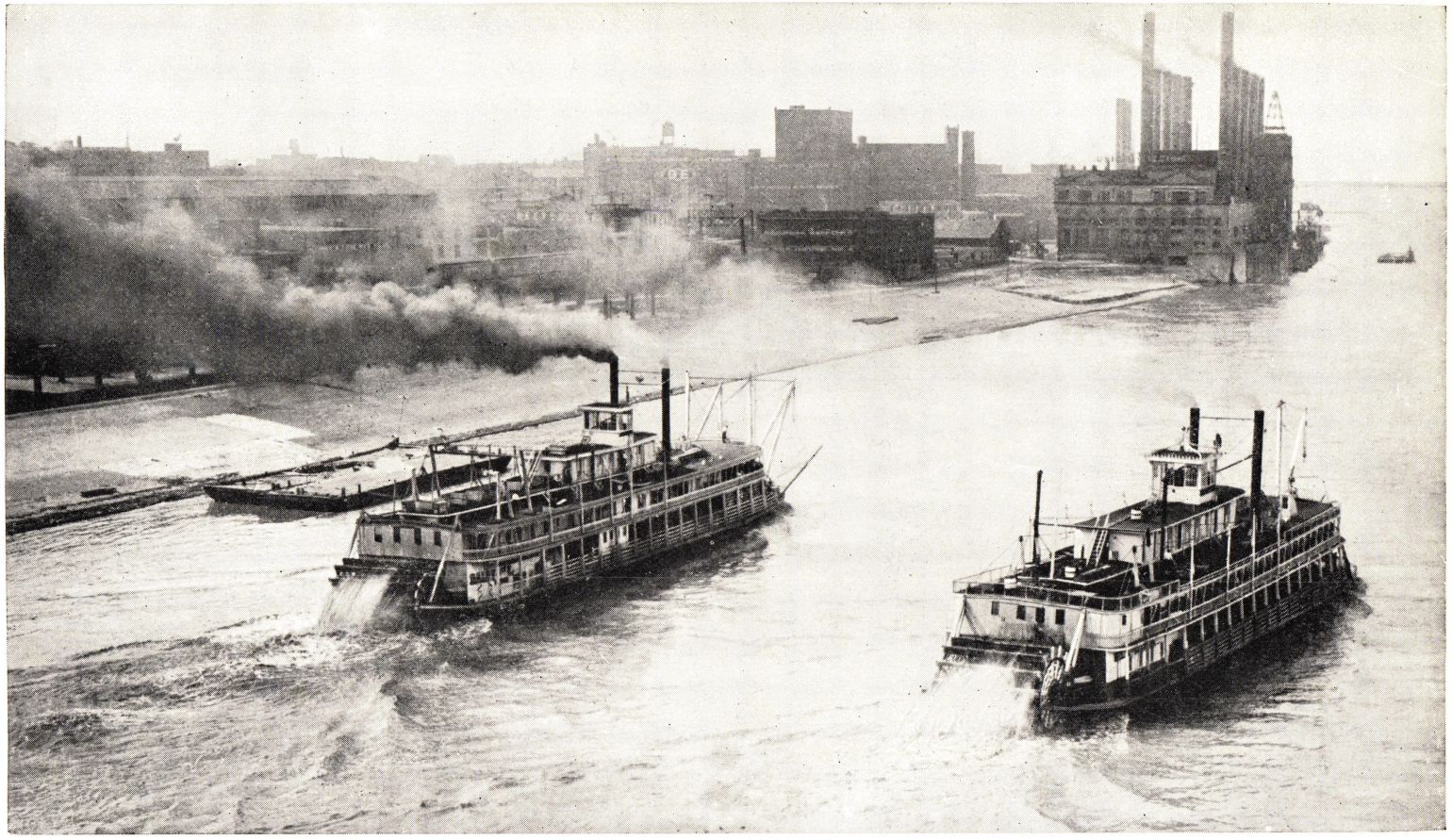
As a result there came a demand for fighting ships fitted with enormous metal rams and with turrets on deck covered with heavy iron-plating. After 1890 battleships were built of steel and rapidly grew larger and faster and in every way more powerful.

Submarines have been the dream of inventors for three hundred years. A one-man affair was devised by David Bushnell in 1775, but he could stay under water only half an hour without suffocating. A submarine capable of carrying four hours' supply of air was built by

© Crété

TALL BARQUE UNDER FULL SAIL

In the barque, the long-range sailing ship is seen at its best, and still competes, to some extent, with the steam vessel. It is a three-master with yards on fore and main masts.



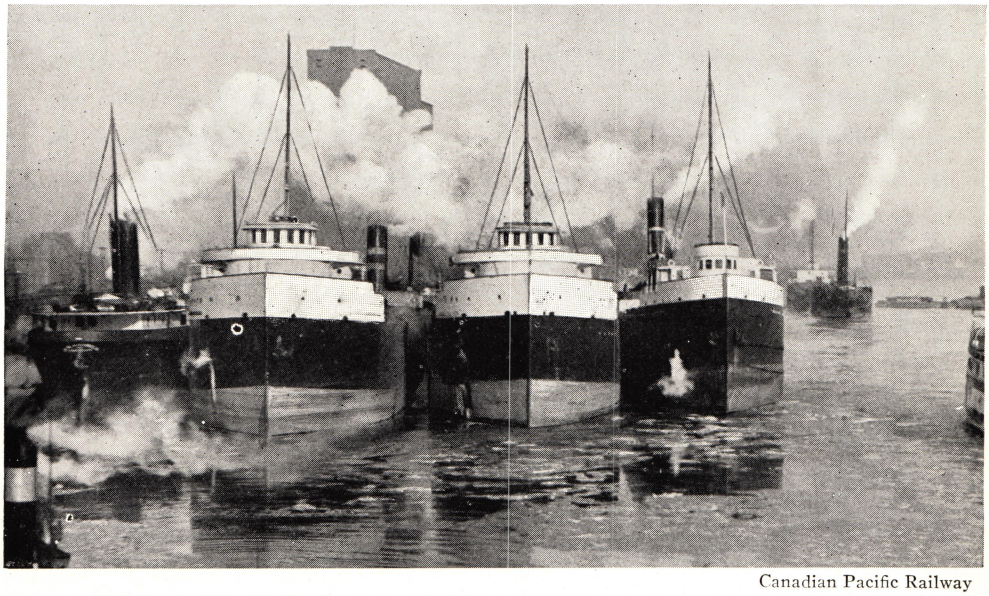
STERN-WHEEL PADDLE-BOATS ON THE MISSISSIPPI AT ST. LOUIS, MISSOURI

The Mississippi, navigable for two thousand miles, presents formidable difficulties to steamboats, as the volume of water carried downstream varies greatly. There have been destructive floods, despite the fact that the banks are strengthened by levees. The stern-wheel paddle-boat has been in use since about 1870 on this river and is especially suited to shallow water. Barges are towed by being lashed alongside. Note the great distance between the engines—situated under the funnels—and the paddles, which are almost out of the water.

© E. N. A.

ONE OF THE SHIPS THAT DO BATTLE ON THE HIGH SEAS

The Greeks and Romans had fighting ships, but in more modern times, until the eighteenth century, navies were usually merchant ships impressed for special service. To-day, however, the battleship is highly specialized. This is a British light cruiser of the Ceres class lying in the French Mediterranean roadstead of Villefranche-sur-Mer.



Canadian Pacific Railway

VESSELS OF GREAT CAPACITY AT FORT WILLIAM IN CANADA

Great Lake freighters have the bridge and officers' quarters set forward, while the crew live aft, an arrangement exactly opposite to the usual practice. Thus they are practically one large hold and, for their tonnage, have a carrying capacity greater than anything afloat. The vessels shown are on Lake Superior.

© E. N. A.

A MASTERPIECE OF THE SHIPYARD: A LINER LYING IN A HARBOR OF CORSICA

S.S. Mauretania anchored off Ajaccio. On account of the need for North America to communicate rapidly and regularly with Europe over a particularly stormy region of the sea, the transatlantic service has always provided the largest and fastest steamships. In 1838 the S.S. Great Western crossed to New York from England in sixteen days. In 1907 the Mauretania covered the same distance in less than five days. The tonnage of the two ships was 1,300 and 32,000 respectively. Recently, the Bremen and the Europa have made quicker passages.

Robert Fulton in 1801. It was called the Nautilus, and when tried remained safely twenty-five feet under water for several hours. Fulton built it in France to be used against the English, and if Napoleon Bonaparte had had foresight enough to realize its value, the whole course of history might have been altered. But Napoleon would not back Fulton in building submarines.

The First Submarine

The modern submarine dates from 1888, when the French designer, Lédé, constructed the Gymnote, a vessel sixty feet long, driven by electric power. This was also the first submarine to be fitted with hydroplanes, or horizontal rudders, to help her to sink. Perhaps the success of the modern submarine boat owes more to John Holland, an American citizen of Irish birth, than to anyone else.

Motor vessels of increasing size and speed have come to the fore just since the World War. They save space by carrying oil in double bottoms and they save time in bunkering. Of course the initial cost is high. The White Star Line is building a motor liner of 26,000 tons for its Liverpool-New York service. Diesel and other oil motors are being used more and more in place of steam engines.

Improvements are constantly being made in the direction of standardizing the construction of vessels so as to reduce the cost of building and operating them. There is a new type of steel which can experience a stress of fifteen tons per square inch. By the latest methods of constructing oil tankers, the frames and beams supporting the shell and deck-plating are arranged longitudinally so as to afford support in the direction of greatest stress.

The Great Atlantic Liners

The size and speed of the great Atlantic liners have been a matter of keen rivalry between the various shipping companies. At the turn of the century the fastest vessels were German. In 1900 the Deutschland made a record when it crossed the Atlantic in something under six days. In 1907 came the Lusitania, which regained for Great Britain the Atlantic record. The Mauretania was even faster. The record for the quickest Atlantic passage is now held by the German Bremen, but it is by no means the largest vessel afloat. Both the Majestic and the Leviathan, which were also built in German shipyards, are larger. They are luxurious floating hotels. But the greatest development the world has seen is found in the Great Lake freighters of North America. The holds of these vessels are so constructed that the ore stored on high piers can slide down chutes and a huge vessel be loaded in less than two hours.

Among recent inventions one that ranks high is the gyroscope, which is used in connection with automatic steering apparatus and ship stabilizers. There is also a device to minimize the effects of vibration that will be welcome to those who suffer from sea-sickness. This is a hydraulic transmission gear between the motor and the ship's propeller. This improvement, coupled with the use of the wireless telegraph and the various life-saving appliances, makes of seacraft a vastly different proposition from the dug-out of primitive mankind.

The Ponderous Ice Breaker

The slow-moving ice breaker Krassin was a craft that sailed into the limelight at the time of the Nobile Expedition. Where other ships were stopped by solid masses of drift ice, the bulky Krassin battered her way with the drive of her 10,000 horse power engines behind her massive steel hull and where aeroplanes had been unable to land, the Krassin smashed her way through soft and ragged ice floes. Canada uses ice breakers in the St. Lawrence and the United States, on the Great Lakes, when ice impedes navigation. Most ice breakers are equipped with huge water-tanks that can be filled when it is necessary to increase the weight of the ice-crushing ship, or to roll the ship that it may smash itself free. There are ice breakers capable of smashing ice which is both discouragingly solid and astoundingly thick, quite as a matter of course.

McLeish

DOG AND DONKEY PULL TOGETHER ALONG A TRIM FRENCH ROAD

In France and in several other European countries, dogs are used as draught animals, but it is not often that we find one thus yoked with an ass. This French donkey is in good condition—fat and undoubtedly well cared for—but he is very much smaller than his wild, African ancestor, for no donkey reaches his full size except in a hot climate.

"DONKEY-WORK"

The Patient Long-eared Laborers of Man

The donkey is too often an animal despised and neglected, though in some countries, where his qualities as an economical beast of burden are properly valued, he is better treated. Spain is the European home of most of the donkey breeds we know, and it was because Spain possessed great herds of donkeys and mules that she became the conqueror of South America, for the donkey and the mule can live and work under conditions where the horse would perish. The mules were able to carry soldiers and munitions into the high places of the Andes in South America, since they were so sure of foot. Donkeys and mules can also go through whole tracts of Africa where a horse cannot live. He is one of the world's burden-bearers, and for his service to mankind, he should have our great respect. "Donkey-work" may mean lowly work, but it is none the less essential to the well-being of the community on that account.

ALL over the world, in every country —north, south, east and west— you will find the little donkey working hard for his living, or, in sunnier lands and arid climates, running wild in herds. He belongs to the horse family, and is, in fact, a sort of poor relation, possessing neither the dignity and noble appearance of the horse itself, nor the distinguished markings of its cousin, the zebra. But the donkey may have the satisfaction of knowing that his position in the animal kingdom is at any rate much better than that of another cousin, the mule, which is a cross between a donkey and a horse.

What satisfaction this gives him there is no telling, for in general, at all events, the poor donkey has not a great deal of which he can be proud nor for which he can be thankful. In any rainy climate he is never seen at his best, because donkeys hate the wet, and they will not voluntarily cross water.

Under natural conditions they are alert, upright little fellows, unlike the sorry creatures seen dragging costers' barrows in the London streets, or waiting in patient rows at the seaside to gallop backward and forward along the sands with children on their backs.

The ass is the donkey's proper name, but he received his other more familiar title on account of his dun color. He is curiously marked right down the back and across the shoulders with stripes which form a sort of cross. Sometimes his legs are striped. Sometimes he is pure white.

It would seem as if Nature were in a freakish mood when she created him, half comic, half pathetic as he is, with his monster, swiveling ears, the long tuft at the end of his tail, stiff mane and harsh bray—that loud and grating "hee-haw"— which does not allow him to express any different shades of emotion.

When a donkey brays he is said to be sorrowing because he senses rain in the air, but instead of sympathizing with him we laugh at his absurd noise! His tail, however, is not a joke. It is very useful for dealing with the venomous, winged insects that infest hot countries, and his swiveling ears are his protection against enemies, for they catch sounds coming from all directions. Being small in build and carrying no weapons of defense, his only safeguard lies in his heels, which enable him to beat a retreat before the danger is too close upon him.

On the grassy plains of Central Asia and Northeast Africa asses are still found in their wild state, and the wild ass is hunted in Persia, where the hide is turned into leather, called shagreen. The milk of the ass is sweeter than cow's milk and is a special delicacy for invalids. There are wild asses in India also, but the ancestor of the domestic ass, or donkey, came from Abyssinia.

The Indian donkey is small and, when domesticated, invariably overworked, having to pick up a living as best it can. It

Nicholls

NEGRO OF MOROCCO ON HIS WHITE DONKEY

Most of the world's patient, hard-working donkeys are descendants of the African wild ass, a beautiful creature as big as a small horse and wonderfully swift, which still roves in herds over the deserts of Northeastern Africa.

is employed chiefly for carrying heavy weights in panniers. It is also used for riding, and two natives and a child may quite frequently be seen all perched on one poor, half-starved little animal.

Not long ago an Englishman going along a narrow pass in the Indian hills came upon a donkey so laden with the household goods of its native owner that it could scarcely move. Its slender legs were literally bending under it, and the owner was beating it mercilessly.

The Englishman promptly flung all the things off its back, while the native stood by, wringing his hands and lamenting to see his treasures scattered in the dust. Relieved of its burdens, the little donkey rolled over, and thus the Englishman had to leave it, comforted by the reflection that it would know a few moments' ease and rest while the scattered load was being brought together again. There was nothing else he could do, for in India there is no law to protect animals from the cruelty and ignorance of their masters.

However, it is pleasant to remember that elsewhere, in such countries as Arabia, Egypt and Syria, the donkeys have a better time and are more prized and better tended. The best kind of riding-donkey is said to be the most comfortable animal to ride. It is strong and tireless, and being fleet and sure-footed, it is used for bearing human as well as other loads in both desert and mountainous regions.

Although it can be harnessed to a cart, the general custom is to fix panniers to its back, and the panniered donkey is a common sight in nearly all Eastern countries. Donkeys are much used in France, and you may see in some towns a donkey and a dog yoked together to a light cart and pulling it through the streets.

Sometimes the donkey may have both driver and wares on its back, as had the one which R. L. Stevenson encountered at Pont-sur-Sambre. "A brisk little woman passed us by," wrote Stevenson. "She was seated across a donkey between a pair of glittering milk-cans, and as she went she kicked jauntily with her heels upon the donkey's side and scattered shrill remarks among the wayfarers."

Though as shrewd and intelligent, neither the French nor the English donkey is so fine an animal as the Spanish. The donkeys in Great Britain are descended from a Spanish breed introduced during the sixteenth century, but they have sadly degenerated since then. George

© CUTLER

THE WATER CARRIER, with a keg of the precious fluid strapped on each side of his donkey's back is a welcome sight in central Sicily during the summer, for little rain falls at that time and many of the streams almost disappear in stony channels. Later in the summer all these green mountain slopes will be scorched brown by the sun.

Borrow, in The Bible in Spain, describes how he once bought a donkey from a Spanish gipsy.

The gipsy who was showing off the animal's paces leaped on its back and whispered something in its ear, and Borrow, amazed at its speed and agility, readily made the purchase. As soon as he had his money the gipsy vanished, and when Borrow himself got into the saddle the donkey refused to budge, except to pitch him off into the mud. He got up and looked about, and there stood the donkey staring at him, as were the rest of the gipsies. He shouted at them to tell him where was the man from whom he had bought the donkey. But there was little to be gained by shouting. Donkey and master had played him a rascally trick—not for the first time, we may be sure.

Unable to do anything with his mount, Borrow was forced to sell it again immediately. One of the gipsies bought it for a trifle, and Borrow lost money over the transaction. It was all a ruse. The donkey would be returned to its master and the gipsies would share the spoil between them.

In Palestine the ass is very useful to the farmer. It will tread the corn, or pull the plow—just as it did, perhaps, in Scripture days, for it was called into the service of man long before the horse.

In South America it is used for almost every kind of traffic. In eastern Turkestan it is to be met with wooden crates full of melons attached to its saddle; in Sicily trotting into town with a monk astride; and in England, to this day, a considerable number of donkeys are employed to carry the mails in remote parts of Cornwall.

Lucky are those donkeys which are kept as pets and only expected to draw

ON THE ROAD TO MARKET IN MEXICO CITY

This Mexican peon and his pack-donkey are on their way to the market in Mexico City, where it is possible to buy anything from flowers and fresh vegetables to beautiful leatherwork and big sombreros like the one the man is wearing. The donkey looks more well-fed than its master, who, like most peons, leads a hand-to-mouth existence.

© E. N. A.

BRINGING WATER INTO A THIRSTY SOUTH AMERICAN LAND

Donkeys are found even in South America—very far from their native land. This one is in Chile, and it is his work to draw a barrel of drinking-water over the dry, barren plains to the nitrate fields of Antofagasta, where every drop of moisture is valuable. The rider is mounted well back so that the ropes may not chafe his legs.

© E. N. A.

DONKEYS HELP THEIR SPANISH MASTER TO DRAW WATER

In many parts of Spain water for the land is scarce, and must be got by irrigation. This ancient farmer of Murcia, a Mediterranean province, sets his pair of donkeys to work, drawing the water from his well. As they circle round and round, the primitive pump mechanism to which they are harnessed brings water to the surface.

© PHOTOCHROME

THIS DONKEY OF BETHLEHEM in no way diminishes the dignity of his Arab rider, for the ass of Palestine is a large animal, very different from the pathetic little beasts of burden a tourist sees in India. It was probably the Egyptians who introduced the ass into Palestine, for they domesticated it before horses and chariots were introduced in the Hypsos period.

© CRÉTÉ

IN NORMANDY, the dairy of Paris, the ass is frequently used as a beast of burden, for it will feed on coarse herbage that other animals despise. Though justly reputed to be stubborn, when well treated it is docile and obedient. This country girl has brought her dairy produce to market in the neat baskets hung from the saddle of her donkey.

light carts. But unfortunately for donkeys, a tough constitution that enables them to survive the sudden changes of various climates, and an ability to live on rough food, such as coarse grasses and thistles, have made them cheap to buy and to keep; consequently they often fall into the hands of people who are too poor to take proper care of them.

Why "ass" and "donkey" should have become words of derision it is difficult to say, for the ass is often not so stupid as its driver. Yet, apparently, even in Shakespeare's time, when it was a new-

Stein

AN ASS IS A SORRY MOUNT FOR A WARRIOR ARMED TO THE TEETH

One might well imagine this fierce-looking Beduin of Palestine, with his long, curved scimitar and old-fashioned gun, to be a brigand chief come down from the hills to rob the pilgrims on their way to Jerusalem. Indeed, had he lived a century or so ago, there can be little doubt he would have been a robber as were his lawless forbears.

Manley

INDIAN DONKEYS HAVE A LIFE OF HARD WORK AND HEAVY BLOWS

These small Indian donkeys are treading corn, work more usually performed in Eastern lands by heavier animals, such as oxen. Fastened together and to an upright post, they must walk around stolidly, spurred on by blows from their master. In more advanced countries the complicated threshing machine is employed effectively to the same end.

McLeish

A COCKNEY HOLIDAY: THE LONDON COSTER WITH HIS "MOKE"

The London donkey, usually known to its driver as "the moke," serves the coster and his family both on work-days and holidays. It is a sturdy little creature, and draws heavy loads about the streets, or to Hampstead Heath for a day's merrymaking. The coster does not usually own his donkey, but hires it and the cart from a donkey-stable.

© CUTLER

A PEASANT WOMAN of Leiria, Portugal, will load her donkey with large panniers even when she herself rides on its back. She sits on a great bundle of cloth to make a soft seat on her way to market over the sandy or stony roads. Fortunately, donkeys are exceptionally strong for their size. The slope shown above is Leiria's Hill of the Angel.

© E. N. A.

ALGERIAN BOYS delight in being sent on errands, for this smart little donkey carries both themselves and their basket. Throughout North Africa the donkey is a valued beast of burden, patient alike under panniers of heavy water-jars, huge loads that seem top-heavy, and warlike men who would be more suitably mounted on Arab horses.

comer in England, it was an object of ridicule, and in A Midsummer-Night's Dream, Puck, playing with the simple-minded weaver, Bottom, casts a spell on him and, to make him ludicrous, obliges him to wear an ass's head.

Perhaps it was because of the ass's recognized humbleness that Jesus chose to ride one into Jerusalem when the multitude was waiting to "spread their garments" in the way and to deck His path with branches. He wanted to demonstrate to the people how meek and lowly was the Son of God; yet that incident has touched the common donkey with glory forever. Mr. G. K. Chesterton, in his poem, The Donkey, puts these words into the donkey's mouth:

"The tattered outlaw of the earth,
Of ancient crooked will;
Starve, scourge, deride me: I am dumb,
I keep my secret still.

"Fools! For I also had my hour—
One far fierce hour and sweet;
There was a shout about my ears,
And palms before my feet."

Boissonnas

REFRESHMENT FOR MAN AND BEAST ON A ROAD IN GREECE

While the master and his friend stop for refreshments after a long hot walk on dusty roads, the pack-donkey takes his meal from a nose-bag. In Greece the donkey is the common beast of burden for his sureness of foot is much needed in a mountainous country, where good roads are few. Transportation by other means would be precarious indeed.

HATS AND THEIR WEARERS

Man's Devices for Covering His Head

Headgear is, and always has been, variously worn for one of these groups of reasons—for protection against sun, rain, wind, sand, cold, mosquitoes or armed human foes; for religious ceremonials; or for style, coquetry, mourning or to accent the wearer's power and place. The earliest form of headdress was probably the skin of some animal or a leaf thrown over the head, but this did not remain firmly in position, and so the hat which roughly fitted the head was evolved. The earliest hats or caps of the Greeks and Romans were quite plain, but as time went on more ornamentation was used and the designs became more elaborate. In this chapter we shall see representative headdresses, practical or fantastic, worn by various peoples, savage or civilized.

THE first hat was probably a broad leaf designed to keep off the burning rays of the sun. Then human ingenuity thought of making a hole in the middle of the leaf to fit the shape of the head and of substituting for the leaf a round disk of felt or skin. One of the oldest known forms of headdress was a close-fitting cap of Sumerian origin worn by the Palestinian captives in the Assyrian age, but on images of the moon god Sin the hat had a straight brim like a low-crowned bowler, or derby.

The ancient Ethiopians stuck a feather in front of a fillet; and western Asiatics from Arabia to Persia bedecked themselves with a full-feathered crown. The Semites, on the other hand, usually covered the head with a cloth which came, in time, to fall over the nape and to be kept in place with a band. This headgear evolved into a cloth cap with ear lappets. The Persians wore a conical cap like a cock's comb; the Assyrians, metal helmets, and the Hittite warriors protected their heads with spherical hats. The Babylonian kings were addicted to pointed helmets with two great horns attached thereto, by way of emphasizing their formidable majesty. Jewish priests adopted a conical cap.

HAT AS TALL AS WEARER

This Papuan dancer wears a headdress that it would be hard to rival. It is built of feathers of the cockatoo, crane and bird of paradise, on a foundation of cane.

Most ancient women wore hoods. Greek women usually covered their heads by drawing up their himations, although sometimes they wore separate pieces of cloth, a veil, a cap, a fillet or a crown to hold the hair in place. Indeed, the simple crown, highest above the forehead, evolved into an extraordinary high crown made of wickerwork, laurel or olive.

In early Germany a hood was the usual head covering, worn in bad weather but otherwise allowed to hang down the back, sometimes as far as the calf, in which case the peak of the bonnet

HAECKEL

IN THE BLACK FOREST, Germany, Sunday clothes are very splendid. Every valley has its own style of costume. A girl of the Elze Valley, where Charlemagne founded a bishopric in the ninth century, has a tall scarlet chimney-pot hat; others wear white hats covered with enormous black or red pompons, or bead coronets shaped like flattened balls.

PARIKAS

THE BRIDAL ROBE of an Esthonian maid from Oesel Island in the Baltic is gaily colored and embroidered, but it is in her hat that she takes greatest pride. Shaped like a basin, it is covered with dangling balls of colored glass and bunches of feathers. Though very elegant, it cannot be comfortable, and the wearer must balance carefully.

McKenzie

BUSY KOREAN HATTER WEARING A HAT HE HAS MADE

The man of Korea never varies the style of his hat. It has a crown shaped like a flower-pot, about six inches high, with a broad, straight brim; it is usually made of horsehair or finely plaited bamboo, dyed black. He wears this queer top hat over a black skull-cap, and ties it under his chin with narrow bands. Note the parts shown in the picture.

© E. N. A.

SIAMESE LADY OF FASHION

This little lady of Siam wears a hat rather like a basket, with handle and all complete. It is very much trimmed with artificial flowers and chains of beads.

ended in a stuffed tail. This hood was usually made of cloth or pliant leather and often lined with fur and trimmed with erect plumes and metal bugles. The early Spanish hood became, at its lower edge, a shoulder cape. The Persian cap was deep enough to reach to the eyebrows in front and to the nape of the neck behind.

When a Roman slave was granted his freedom, his head was shaven and a red pileus, or woolen cap, was placed upon it in token that his days of servitude were at an end. Time and again, when the lowly bondsmen of Rome were stirred to revolt, the cry that went up from their ranks was: "Rally 'round the cap!" It is interesting to reflect that when Liberty figured on a statue or a coin, she was shown with the cap of the workman on her head. Caps were the usual headgear of the men of the Celtic and Gothic races before the tenth century. At one time, too, a Swedish political party was derisively called the Nightcaps, or, later, Caps, while the opposition was known as Hats, from the tricorns worn by officers and gentlemen. In the seventeenth century parties in the States came to be known by

their dress, and the Puritans wore wide-brimmed high-crowned hats without band or feather, while the Cavaliers appeared with feathered hats on their long hair.

The wide hats crowned with plumes eventually became reduced to flat caps with feathers at the sides, then caps with slashed edges bushed out with feathers. Plain folk of course wore plain caps.

The cap has also played its part in fable and fairy tale. Was there not the wishing-cap that the sultan of old gave to Fortunatus, which the lucky possessor had but to place upon his head to find himself conveyed to wheresoever he desired? Then there was the windy-cap of Eric, king of Sweden, who, merely by turning this cap in a certain direction, could cause the wind to blow from that quarter. This old legend survives to-day in the "capful of wind" about which sailors talk.

When the Scotch Highlanders see an eddy of wind whirling the dust and leaves about, when the day is otherwise quiet, they say the fairies are trying to whirl someone away, and they hurl their bonnets

Gellibrand

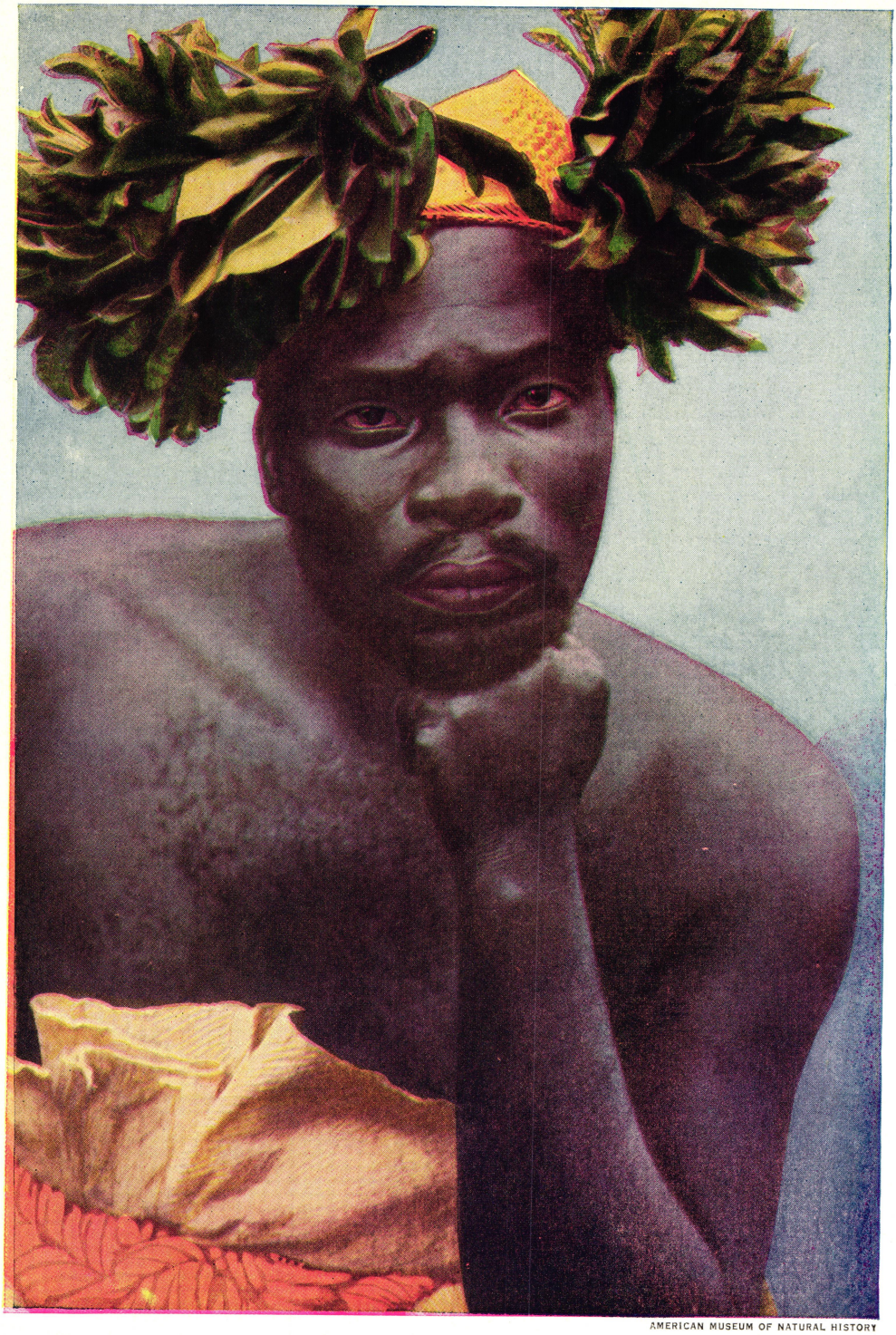
NOBLE BEGGARS OF JAPAN

These street musicians are penniless Japanese noblemen, and they wear these strange hats that serve also as masks so that no one will recognize them.

Merriman

LITTLE BOYS WHO WEAR UMBRELLAS ON THEIR HEADS

Music-makers, however, are not afraid to show their faces as they play in the village streets of Japan. The great straw hats of these little minstrels make very effective parasols in sunny weather, and what is more important, for Japan is an exceedingly rainy country, they also serve as umbrellas, and keep both heads and shoulders dry.



AMERICAN MUSEUM OF NATURAL HISTORY

BUNCHES OF FEATHERS from some bright bird, likely a green parrot, add to the prestige and self esteem of this savage chieftain from the forests of Central Africa. He rules over a particularly warlike and ferocious tribe in the northwestern part of the Belgian Congo. The cap to which the feathers are sewed is made of woven palm fibre.

to make the fairies drop their booty. Indeed, the custom of flinging a hat at a whirlwind is also practiced in Germany and Esthonia. The Scotch cloth cap or "bonnet" bore a sprig of heather; to this the chiefs added an eagle's feather.

"A Feather in Your Cap"

How often one hears the expression, "It's a feather in your cap!" It was once the custom among certain peoples to add a feather to the headgear for every enemy slain; and even now a successful sportsman may stick in his hat or cap a feather from the bird he has brought down.

Another phrase we often hear is "donning cap and bells," which means amusing people by playing the fool. This phrase originated in the Middle Ages when kings and great nobles kept a jester or court fool, who wore a special cap and had bells fastened to his costume. This cap was usually a hood as well and fitted tightly over neck and shoulders, while up the back ran a piece of material shaped like a cock's comb and at each side sprang two long donkey's ears of cloth.

Gradually the cap became a symbol of high renown. The Cap of Maintenance was an emblem of ducal rank. The Pope conferred it as a symbol of honor three times on Henry VII and once on Henry VIII.

A Symbol of Trust

The modern practice of lifting the hat as a gesture of respect dates from medieval times. When an armored knight entered an assemblage of friends he removed his helmet and so exposed the most vulnerable part of his person by way of signifying his trust in those present.

The pilgrim's hat was called a cockle because devout men put cockle-shells upon their hats to indicate their intention of going on a pilgrimage. On one of the walls of the old Palace of Westminster was found a painting of a pilgrim with his cockle-hat, which was covered with the same skin, ermine, apparently, that formed his coat.

In Friesland, a province of the Netherlands, the people used to place upon the head first a knitted cap, then a tall silk skull cap, third, a metal turban which was a shrunken form of helmet, and over this array an immense scarlet bonnet.

We are told that Henry VIII wore a bonnet ornamented with silver, gold and feathers when he attended a banquet at Westminster. At about the same time Milan bonnets came into fashion. They were so named because they were first made in the Italian duchy of Milan, whence also comes the modern word "milliner" (Milaner). These bonnets were made of cloth-of-gold and silver, velvet and satin, slashed and puffed as were the dresses, and decorated with gems and hanging ornaments.

Men's Hats Were Feathered

In the reigns of Charles I and Charles II hat brims became much larger, so much so that they hung down over the face and ears. For this reason they were called "slouch" hats. These broad brims were ornamented with feathers all around, a fashion that persisted through the reigns of James II and William III. But the inconvenience caused by this floppy brim brought about a new mode. One portion of it was turned up at the front, back or side of the head—"cocked" in other words. In course of time two sides of the hat were turned up, and in the days of William and Mary a third portion was raised. Thus originated the cocked hat.

In this same reign and that of Queen Anne, the dandies wore wigs, and the great ladies caps so tall and elaborate that wearing a hat was impossible. However, a hat was used, but it was carried—a "chapeau-bras"—under the arm.

Women's hats, throughout the ages, have been even more interesting than those of men. As we have seen, hats and caps were really not in common use until the twelfth century, but by the fourteenth century many fashions had evolved, with increasing ornamentation. Now English women adopted a steeple-horned hat draped with a kerchief—the steeple being a long black cone worn at an angle of forty-five degrees, a fashion at first considered immoral. There followed sugar-

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IN PALESTINE, an Arab girl often carries her dowry on her head. She edges her close-fitting hat with overlapping coins, and hangs any others she may get from her chain chin-strap. When out of doors, she also wears an embroidered head-cloth that hangs over her shoulders.

A LADY OF CHILE on a Sunday morning, puts on her "manto," for without it she may not enter a church. Sometimes it serves just as a veil; sometimes, as in this picture, it takes the place of both hat and coat. It has been developed from the graceful Spanish mantilla.

©E. N. A.

AN ENORMOUS BOW of black ribbon set with the tricolor cockade is worn by this woman of Alsace. We may see many like it in the districts south and west of Strasbourg whenever the gay national costume is worn. Sometimes we see it also in the parks of Paris, and then we may be quite certain that the wearer is an Alsatian nurse.

Pollard

HATS MADE OF THEIR OWN HAIR

Women's millinery varies. A girl of the Nosu tribe—an aboriginal people living in South China—cannot take her hat off, because it is made of her own long, thick hair, mixed with large quantities of wool dyed the same color.

loaf and thimble-crowned hats with the brim turned up in various styles. In the late fourteenth and early fifteenth centuries a lady often covered her head and hair with a caul, which at first was a great bag of gold net enriched with gems. This structure was later stiffened with wires and made of other materials than net, and came to assume the most wonderful shapes. Sometimes it bore two great horns as much as fourteen inches in length that spread out sidewise or stood straight up above the head. Bossed cauls were also drawn high on the sides to make the face heart-shaped. A little later a butterfly headdress became popular. Here wires were set in the caul to allow the veil to float behind. Women first wore the mob-cap in private. Then the French Revolution put a check on the extravagances of men and women alike, and with the vogue for simplicity came the towering mob-cap, an humble conception albeit adorned with lace and ribbon. Turbans of all materials, from lace scarfs to velvet, also came into popularity.

The saying "she sets her cap at him" comes to us from the days when ladies habitually wore caps and would naturally don the most becoming one in order to attract the attention and admiration of their favorite suitors. Early in the eighteenth century there was a shepherdess hat shaped like a saucer and perched upright on the hair but rising at the back. Women macaronis, for a time beginning in 1772, wore a towering headdress of flowers and feathers that fairly hit the chandeliers. Compare this with the attire of the gentleman savage on the first page of this article!

Toward the end of the eighteenth century there was another period of extraordinary hats. Women had for many years been wearing simple bonnets and caps. Then large powdered wigs came into fashion, and the caps grew, in order to cover them, into enormous starched erections of muslin and ribbons. Little hats were perched at a queer angle on the wigs, but these developed in the opposite way to the caps, for when the wigs became smaller the hats became really immense. The wigs were replaced at home by nightcaps of silk or velvet, and caps came to have long lace lappets or fan-shaped topknots. The capote was a bonnet first appearing in England at the beginning of the nineteenth century. At first it had a back of cloth and a peak of straw (much

McMahon

YOUNG SOLOMON ISLANDERS CANNOT DOFF THEIR HATS

Their globular caps of sago-palm leaves show that these young savages have reached a marriageable age. They must keep them on for two years, and by that time their hair, which is plaited and bunched inside the hat, will have grown so much that it will fill the hollow space entirely. The hair must therefore be cut off before the hat can be removed.

CUTLER

CHIMNEY-POT HATS are worn by women near Llangwm and other country districts of Wales, for they are part of the Welsh national costume. A snow-white bonnet usually frames the face beneath the black brim. One cannot help wondering if the witch who introduced the fashion in witches' hats was of Welsh origin.

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GALA HATS IN SAMOA are very elaborate. Those of these two girls of Pago Pago, on Tutuila, the one fine harbor of Samoa, are built up of shells and flowers, feathers, tow and plaques of mother-of-pearl. Samoan warriors have a similar headdress.

WARRIORS DECKED FOR THE DANCE IN KENYA, EAST AFRICA

From the birds' plumes he uses in decorating his headgear we can often tell from what country a native man comes. We might think that these men were South Sea Islanders, for instance, if we did not see that their magnificent hats were made of curling black and white ostrich plumes, and the ostrich is, we know, an African bird.

like that of the later sun-bonnet of the United States of America). Later, it acquired a veil. The hat varied in shape until by 1818 it was composed of a frame of wood covered with satin or velvet and decorated with ribbons, flowers or feathers. By 1840 the capote had become close-fitting; then the upright plume again appeared, as the crown lowered and the brim broadened. Some of the women's hats of the present day are faintly reminiscent of ancient styles, though modified to meet present-day conditions. The first open cars made automobile veils a necessity to keep large hats in place, and bobbed hair brought about snug-fitting hats that required no pins. Certain hats that followed were like the helmets of aviators.

GIPSIES IN MANY LANDS

The Ways of Nomad and Vagrant Folk

What we call "gipsy camps," sometimes seen on country roadsides, are more often merely groups of vagrant van-dwellers and not true gipsies. The real gipsies are found in Asia, Europe, Africa and the Americas, but they originally came from India to the Balkan lands, and after several centuries have spread to other countries. They are called gipsies because at first it was thought they were Egyptians. In Sir James Barrie's story, The Little Minister, a gipsy girl is called the Egyptian; but no gipsies ever came from Egypt. They are everywhere an interesting and cleanly people, not like so many countryside vagrants who are merely low-class people of our own race. The Beduin is a nomad whom we have read about in our chapter on The Desert Rangers. Here we shall have a glimpse both of the real gipsies and of other wanderers who prefer to live in the open rather than in houses.

WITH their brightly colored shawls and handkerchiefs, with their swarthy faces and the mystery that surrounds their movements, the gipsies appeal to the imagination of us all. They seem to be so free from all the cares and responsibilities of ordinary people.

It may be that our earliest thoughts of them were inspired by fear rather than attraction. We were, perhaps, told stories, for which there is happily no foundation, of their kidnaping little children and ill-treating them; but as we get older we look at them wistfully and think how nice it would be to live always in the open air and in the country, going where we pleased and when we pleased, and never having to worry about to-morrow, so long as the big stew-pot, hanging from three poles over the fire, had plenty of good things in it for to-day.

No one has done more to draw attention to the gipsies than a writer of the nineteenth century, George Borrow, who himself wandered about England in gipsy fashion for some years, making friends with them and learning their language and their ways. He described his adventures in two books called Lavengro and The Romany Rye.

The gipsy love of the open air and of the open road is beautifully summed up in a little conversation between Jasper Petulengro, or Smith, who is a real gipsy and the leader of his tribe, and Lavengro, who is only playing at being one.

Jasper says: "Life is very sweet, brother. Who would wish to die?"

And when Lavengro says that he would rather die than live in misery, Jasper tells him he talks like a fool.

"A Romany chal," he says, "would wish to live forever."

"In sickness, Jasper?"

"There's the sun and the stars, brother."

"In blindness, Jasper?"

"There's the wind on the heath, brother; if I could only feel that, I would gladly live forever."

It is this content with very simple things that makes the gipsy life outwardly so attractive and that makes the gipsies themselves such a care-free, happy-go-lucky race; but it is this same easy-going contentment which has kept the gipsy people in all parts of the world in a backward state.

From a careful study of their language it seems to be almost certain that they originally came from India. The name "gipsy" is a corruption of Egyptian and was given to them because at one time they were thought by the people of Europe to have come out of Egypt. This arose from the fact that they used to call their leaders Lord or Duke or Earl of "Little Egypt."

By the fourteenth century there were gipsies in Greece, but it was not until early in the fifteenth century that the first large band wandered farther into the countries of Western Europe. Sometimes the band became divided into two separate

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CLACKING CASTANETS accompany the dance of these supple gipsies of Granada, in Southern Spain. Ever ready to dance or play the guitar for a little money, they now live, some in houses and some in caves, in the Albaicin (or Albaycin) quarter, which was once an abode of Moorish nobles, but it is now very shabby.

HARDY—

A GIPSY GIRL OF SPAIN is not so easily recognized as is a gipsy girl in another land, for she shares her most striking characteristics—her black hair and eyes and gleaming smile—with the women of her adopted country. She can be known, however, by the bright colors she wears, for the Spanish women are almost invariably clad in black.

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GIPSY DANCERS IN PERSIA, THE LAND THAT FIRST EXPERIENCED INVASION BY THE VAGRANT GIPSY FOLK

We do not usually associate gipsies with dancing and music, but in the lands of Western Asia and Eastern Europe, as well as in Spain, gipsies are famed for both. Persians, especially those of culture, consider dancing to be undignified and degrading, and never practice it themselves. But that they enjoy watching it we can see from this photograph, which shows two gipsy performers in a courtyard of a Persian village. It has been proved, from their language, that the gipsies came originally from India, probably about 1100 to 1200 A.D.

Payne

THE BEAT OF A DRUM WILL MARK THE TIME FOR THIS SERBIAN GIPSY DANCE

In the Balkans there are more gipsies than in any other part of the world, and in those countries they have not met with the oppression that they brought upon themselves in lands farther west. They do not mingle, however, with the natives of their countries by adoption, but remain as a race apart. They are always welcomed by the peasants on occasions of jollity, such as weddings or feast days, because they are such skilled musicians and such merry dancers. These gipsy men are about to entertain a Serbian village by performing a dance.

EDWARDES

THERE ARE MANY NOMADS in the world who are not of gipsy blood, but most of them lead a wandering life of necessity, not through love of it. These Afghan herdsmen, for instance, rarely stay long in one place because only here and there upon the wild and desolate mountain slopes do they find the wherewithal to feed their flocks and herds. What little verdure they do find, such as the scrub grown among the stones, is soon exhausted; then the whole tribe must move on to another green patch. Herdsmen make up numbers of the earth's wanderers.

© LAVOY

A VARIED ORCHESTRA, composed of a mandolin, a violin, a flute and several tambourines, accompanies this gipsy dance in a courtyard in southern Serbia. Of uncertain origin, these wandering peoples may be found on every continent, though they seem to prefer the neighborhood of the Balkan Peninsula. The first name by which they appear in history was Atzigan or Atzingan (corrupted to Tzigan and Zigany). Certain of their own numbers call themselves Roms (Romanies); but every country has its own term for them.

Nicholls

COOKING BREAKFAST ON A FIRE OF FURZE IN A GIPSY ENCAMPMENT ON EPSOM DOWNS

The English gipsy, with his caravan and tent, his foreignness and roving life, is now regarded as a picturesque and rather romantic figure of English country life. But once things were very different. When the gipsies first arrived in England, about 1500, they were well treated by all, but, as in other countries, their craftiness, their thievish ways and vagabond life soon turned the people against them. They were then treated as outlaws, accused of crimes they had not committed, and were even put to death simply because they were gipsies.

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TRAVELING HOMES OF THE GIPSIES IN AN ENGLISH LANE

The caravan in which a gipsy family lives when on the road is a little wooden, two-roomed hut on wheels, gaily painted and complete even to the chimney. At one time the gipsies were thought to be Egyptians—indeed, they fostered the idea by calling their leaders Lords of Little Egypt—and that is how they got their name.

groups, led by chiefs known as Duke Andrew and Duke Michael. Not long afterward other bands followed them in considerable numbers.

Many curious stories about the gipsies were widely believed in those days. One story was to the effect that the family from which the gipsies were descended had refused hospitality to the Infant Jesus and His mother when they went down to Egypt, and that they had been compelled to wander about the world to atone for their sin. The gipsies did not start this story, but they found that it made them more interesting to many people, so they soon began to encourage it and to profit by it, and even to believe it.

They did not, however, behave on their wanderings at all like pilgrims who were doing penance. The women were very clever thieves and were able, by dexterous movements of their hands, to pick up small articles without attracting attention. They also had a bad habit of poisoning the farmers' pigs with some drug that affected the brain without spoiling the flesh. They then begged for the carcases, which were supposed to be useless, and so kept themselves and their families supplied with pork. Gipsy women have always been great fortune-tellers, and the men have mostly been metal-workers, musicians, farriers and horse-dealers. In earlier times the men also engaged in highway robbery, and to this day they are still, frequently, inveterate poachers.

As workers in metal, especially in iron, tin and brass, the wandering gipsies were often very useful to the settled inhabitants, for they made horseshoes and kettles and other articles of common use, as well as more elaborate productions.

It was in connection with their work as blacksmiths that another quaint superstition arose about their origin. A story got about that they were compelled to wander because a gipsy had made the nails for the Cross; but because he had afterward stolen one of the four nails, God had given his descendants permission to continue stealing whenever they had need. It is interesting to note that just about the time that gipsies first appeared in Europe, pictures of the Crucifixion be-

gan to be painted showing only three nails.

The English gipsies always use the word Romany in speaking of their race; they never speak of themselves as gipsies. In countries where they are not Romany, they are called tsigane or zingari, or, in its German form, zigeuner.

The strongest bond between the gipsies of all nations would seem to be their language. They have a great facility for picking up words and forms of speech in the countries through which they travel. but underneath all their variations of dialect there are, perhaps, about two thousand words for common things and ordinary actions, which can be traced back to Hindu sources and have been preserved more or less intact by gipsies almost everywhere.

The purest Romany is said to be spoken in the countries of South-

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SINGING KETTLE AND SIMMERING POT HANG OVER THE GIPSY FIRE

Approaching caravans are always viewed with misgivings by countryfolk, for when gipsies are about things are sure to disappear. The farmer must guard his hen-roost and make everything secure under lock and key, for the gipsy is a born thief and pilferer. These English gipsies expect to earn money in the Kentish hop-gardens.

© Cutler

ANCIENT MEMBERS OF A GREAT BROTHERHOOD OF WANDERERS

Every part of the world knows this kind of nomad, vagrants of all nationalities, with no home and no occupation except begging—just tramps. These two old Hungarians are resting on the dusty grass by the wayside, while she smokes her big pipe and he makes a meal of tomatoes, the cheapest food procurable in Hungary.

eastern Europe, especially in Hungary and Greece, while the English Romany is much less pure, probably because there are fewer gipsies, and because they have traveled less and so have had more time in which to adopt the speech of the people about them.

A gipsy man is a Romany chal, a gipsy woman a Romany chi. Everybody who is not of gipsy blood they call a Gorgio, and when talking to one another they say "Brother" or "Sister"—in their language "Pal" or "Pen." A "rye" means a "gentleman," and a "rawnie" or "rani" means a "lady."

The gipsy women have generally been cleverer than the gipsy men, and in every country where they have traveled their "dukkering," or fortune-telling, has brought them at times into relationship with royalty. Britannia Lovell, a famous gipsy, told the fortune of George IV when he was still prince regent, on Newmarket Heath, and is said to have received five pounds and a hearty kiss from him as her reward. Pepita, a Spanish gipsy, told the "buena ventura," or good fortune, of a Queen of Spain, and Modor, a gipsy of Moscow, did the same for an Empress of all the Russias.

Too often, however, the gipsy women did not confine themselves to fortune-telling, but played tricks of a more dishonest nature on the ladies who listened to their tales. One such deception was to persuade the lady that if she placed a sum of gold in the gipsy's hand and then made a parcel of it and hid it between her feather bed and her mattress, leaving it there for a year without looking at it, she would find at the end of that time that the sum had increased. Simple-minded people were ready to believe anything that the gipsies told them; but at

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HUNGARIAN TINKER WORKS WHILE HIS LARGE FAMILY WAITS FOR ITS EVENING MEAL

The wandering Hungarian gipsy, when he does any work at all, as often as not occupies himself in mending the large metal preserving-pans of the peasants, for metal-working is a craft at which he is skilled. It is thought, indeed, that our word "tinker" may be derived from "tsigane," the Hungarian name for a gipsy. Only about one gipsy in thirty is a nomad in Hungary, for when the tribe first settled there many of them were made the serfs of the nobles and were forced to work for them. They only became their own masters in 1782.

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GIPSY STRING QUINTET PLAYING ONE OF THE LILTING AIRS THAT HAVE MADE THEIR PEOPLE FAMOUS

These gipsy musicians lost much of their picturesqueness when they adopted Western clothes, but we have only to hear them to forget entirely their unprepossessing appearance. The gipsies of Hungary have, to a greater degree than their fellows, developed their musical genius. Not only are they sure to be present at every village festivity, but a permanent orchestra of them is retained in many big city restaurants and hotels. Once every Hungarian "boyar," or lord, had his gipsy fiddlers, even as every medieval baron had his minstrels.

© Cutler

COIN-BEDECKED ROMANY BEAUTY AND HER "RAKLO," OR BOY

When young, a gipsy woman is often beautiful, but she soon loses her good looks. She never, however, loses her skill at palmistry and fortune-telling with cards or her knowledge of charms. The gipsy language in English-speaking lands is a jargon of English and gipsy words, but in Hungary and the Balkans it remains fairly pure.

Rumanian Legation

YOUNG RUMANIAN "URSARI" AND HIS PERFORMING BEAR

The "ursari," or bear leaders, are members of an honorable gipsy calling. The bear is caught young, and when trained to dance and perform tricks is sure to bring in enough money to keep his master. Rumanian gipsies were almost slaves until quite recently. It is said that in 1845 two hundred families of them were auctioned in Bukarest!

the end of the year, when the gipsies had wandered far away, on opening the parcel they would find that the bag of gold coins had been cleverly changed for one exactly like it, but which contained only a few halfpence and farthings.

Among the English gipsies there are certain family names such as Lee, Hearne, Lovell, Boswell, Smith, Cooper, Stanley, Marshall, Grey and Buckland, which are met with again and again. It is probable that in many cases gipsy families adopted these names from the great men on whose lands they had been allowed to camp, though two of them—Smith and Cooper—represent trades which they were wont to follow.

They have a wonderful assortment of Christian, or first names. The writer was once at a gipsy christening in Norfolk, where the baby was named Magenta. Perpenia, Tryphenia, Syeira, Shuri, Meralini, Reyna, Fenella and Orlenda are a few typical names of gipsy girls; the boys' names are less unusual, though Plato and Pyramus are not uncommon.

The gipsies cannot be said to have any special religion of their own. When they first started on their wanderings they probably professed some form of Hinduism. The word which they use for the Christian Cross is the same word which means in India the trident of the Hindu god Siva; but they long ago lost whatever faith they ever had. In Mohammedan countries they profess to be Mohammedans, and in Christian countries they belong to that faith. They like having their babies christened; in fact, they sometimes manage to have them christened several times in the different places in which they stay, for they regard baptism as some kind of potent charm.

For the most part, gipsies are handsome

LITTLE NOMAD SAMOYEDES ON THEIR WIDE-ANTLERED MOUNTS

In many lands of the Far North—in Lapland, Alaska and Arctic Siberia—there are nomadic peoples who wander over the frozen territory to seek grazing for their vast herds of reindeer. There are Lapps in Lapland, Eskimos in North America, and Samoyedes in Siberia. They do not follow their herds on foot but make their reindeer carry them on their backs.

Talbot

RESTLESS WANDERERS ON THE DRY AND DUSTY ROADS OF INDIA

India, the native home of the true gipsy, has also its wandering tribes whose home is the wayside. Among them are the Banjaras, or Brinjaries, who used to be a tribe of grain-carriers and grain-dealers, traveling from place to place. Most of them are now merged into the settled population, but some cannot forsake the life of the open road.

folk, with dark eyes and complexions, teeth of dazzling whiteness, lithe sinewy bodies and rather small hands and feet.

Some of them travel about in caravans, the equipment of which always includes a stove, with a chimney going through the roof; but the natural dwelling of a gipsy is a tent, oblong in shape and very simply made. Two rows of long rods are stuck into the ground opposite each other. The tops are bent over till they meet, are tied together, and then coarse brown cloths are thrown over the whole, skewered together at the top and pegged down at the bottom. In recent years we find many gipsies traveling in motors rather than in horse-drawn vehicles.

There used to be several open spaces in London where gipsies congregated with their caravans and tents in winter-time, when the woods and commons of the country had grown damp and cold; but, both in town and country, the life has lost much of its attraction of late years, for policemen, educational authorities and all kinds of inspectors make the gipsy mode of living in the British Isles less free and easy than it used to be.

On the continent of Europe there are believed to be about three-quarters of a million gipsies, the largest proportion being in Rumania, Hungary and Bulgaria; and there are immense numbers in Armenia, Persia, Syria and other Asiatic countries, as well as in Egypt, Algeria and other parts of Africa.

There have been considerable migrations of gipsies to the Western hemisphere. In America they are to be found from Canada to Brazil, but most of all in the United States, and there are scattered bands of them even in Australia and New Zealand. These newer and sparsely populated countries offer the gipsy folk less scope for practicing deceptions on their fellow-creatures, but they are far more suitable for the genuine gipsy life of free, unfettered wandering and camping under the open sky than are the crowded lands of Europe.

In the countries of Central and South-eastern Europe the gipsies are famous for their music, which is wild and wonderfully effective. Their principal instrument is the violin, and the great composer Liszt called them the founders of the style of

music for which his native Hungary is famous. Gipsies play exclusively by ear, but with a remarkable technical accuracy. In Wales, where there are many of them, they often exchange the violin for the harp.

In the course of their wanderings the gipsies have suffered from terrible persecutions, which were partly brought upon them by their own misdoings. It often happened that when they first appeared in a new land they were treated kindly and were respected for their undoubted talents and for their knowledge of far distant countries, but they soon got a bad reputation. The thefts and robberies that were always associated with their stay in any place brought on them the wrath of the authorities, and they came to be accused of worse crimes —child-stealing and even cannibalism— of which they were guiltless.

TRIO OF MUSICAL VAGRANTS OF THE GREEK PENINSULA

The Greek gipsy uses a drum and a kind of flageolet instead of a violin, but he, too, is a merry music-maker. Greece was the first European country to know the gipsy, and as early as 1378 a gipsy chief named John had considerable feudal power in the Peloponnesus. Several ruined strongholds there are still known as "gipsy castles."

FAR FROM THE IRON ROADS

How People Travel in Out-of-the-way Lands

When looking out of the window of an express train thundering along at a mile a minute, we may wonder how people travel in those parts of the world where there are no railways. A journey of a hundred miles is nothing by train, but in some lands it means several days of preparation followed by much discomfort and fatigue. The late Maharaja of Bhutan had to travel for seventeen days along the mountain paths of his own country to reach the Indian frontier when he attended King George V's Durbar at Delhi. In this chapter we shall read of the strange animals, queer vehicles and methods of human back-packing that are used in places where no railways run.

IN August, 1926, a famous airman flew across the continent of Australia from south to north in three days. Yet it still takes nearly three months to bring gold down to the coast from the goldfields of the interior of the Great Sandy Desert of Northwestern Australia. Caravans of camels do all the work of transport in this barren region. The pack-camel carries a load of three hundred pounds and will cover about thirty miles a day.

Camels are still the chief carriers over a very considerable portion of the earth's surface. All over North Africa, Arabia, Persia and Turkestan and through the desert of Gobi as far as the border of the Chinese Empire these long-legged, queer-tempered but wonderfully enduring creatures carry men and merchandise exactly as they did thousands of years ago.

Afghanistan is a country with few roads and no railways, and people usually travel on horses or camels. The wealthy Afghans and ladies of high degree use a kind of horse-litter, which is said to be most comfortable. It consists of a hammock slung under an awning and is fixed upon poles, the ends of which are attached to pack-saddles worn by a pair of horses.

The sedan chair in which English ladies of the eighteenth century went to balls was carried by two men. A similar chair survives in the palanquin of the East. It is a box of bamboo slung upon two poles. Inside is a chair provided with an awning to keep off the sun. The poles are so springy that there is little or no jolting as the passenger is carried along by two or four strapping coolies. Palanquins are used in Madagascar.

In many parts of the East men still take the place of transport animals. In spite of railways and motor cars, the jinricksha is still popular in Japan. It is a light vehicle fitted with a hood and built rather like an American phaeton. The wheels are large but light. The 'ricksha man wears a big straw hat which looks like a basin turned upside down, and an odd straw cloak. As he is accustomed to the work from boyhood, he thinks nothing of a twenty-mile journey, and on the level he travels at a good pace.

The bullock-cart is known in many parts of the world, and is usually a very rough and primitive vehicle drawn at a pace that rarely exceeds two miles an hour; but in India there may be seen well sprung bullock-carts provided with awnings and drawn by little trotting bullocks. The heavy bullock-cart is still used in northern Spain and Portugal, where it has wheels made of solid disks of timber fixed upon wooden axles. In Portugal the axles are left ungreased, that their noise may frighten away evil spirits. Here at vintage time the grapes are emptied into great vats on wheels which are drawn to the wine presses by stolid oxen.

Many parts of the world are so mountainous that it is impossible to build railways or even roads. Everything that needs to be transported in those districts must be carried by pack-animals or else by porters. The mule is the most common pack-animal because it is sure-footed and hardy, but in the Himalayan Mountains yaks are sometimes seen, and among the Andes llamas may be used. Human

Percival

PORTAGE ON A "ROAD" THROUGH THE FORESTS OF WEST AFRICA

In Nigerian forests the rivers are not used as highways to the extent that they are in the Montaña of Peru. There, indeed, the rivers are impediments, not aids, to traffic. Narrow trails are made through the forests and everything is carried by muscular native porters. The many creeks and streams are crossed by the flimsiest of bridges.

porters are also commonly employed in many parts of Africa; they are, indeed, the only means of transport in many districts there, because the heat is too great for any pack-animal, there are no roads for vehicles and the rivers are too overgrown with reeds and too shallow or rapid to be navigable.

The mountaineering clubs of the Western United States and Canada often employ pack-mules as far as there are trails for them, then take to back-packs in the manner of Swiss Alpine climbers.

In the frozen far north of Europe within the Arctic Circle, and all across Arctic Siberia, reindeer are the only draught animals, and they draw loaded sleds with great rapidity over the frozen ground. In other Arctic lands, however —Alaska, north Canada and Greenland— teams of half-wild dogs, called huskies, are employed to draw the sledges over the ice and snow.

To see dogs at their best in harness, it is necessary to visit Alaska and the great Northwest of Canada, and to watch a team of true huskies drawing a sledge at full gallop along the frozen surface of some great river, say, the Yukon. They race along at ten or twelve miles an hour and will keep up this pace for distances of fifty or sixty miles. Although experiments have been made with ponies and reindeer, it has been found that no other animal can compete with the dog in the drawing of a sledge across snow and ice during an Arctic winter.

In the first place, a dog can endure intense cold far better than a horse, and secondly, he is appreciably more easily fed, since a small daily portion of dried fish keeps him in good condition. A third advantage possessed by a dog is his comparatively light weight, which enables him to travel on top of a snow crust through which any larger or heavier animal would break and sink. All trappers in these regions, as well as prospectors and mail-carriers, use dog teams, and high prices are paid for good husky dogs. A thousand dollars is not an unusual sum to give for a good team.

Ramsay

WAGON TRAIN MAKING SLOW PROGRESS ON A TURKISH ROAD

Many of the roads of Anatolia, or Turkey in Asia, are hardly "roads" at all, being simply tracks worn comparatively smooth by the passage of countless human feet, hoofs and wheels. Yet, since railways are few, they are in constant use. The usual vehicle is the araba, a wagon that can lurch into deep holes and over bowlders without upsetting.

PRECIOUS PRODUCT OF BURRAGORANG'S MINES ON THE ROAD

On another page we see how Australian gold is carried from the mines in the far west of the continent. Here we see silver being carted over the hills of New South Wales, in the east. A loaded wagon needs ten strong horses to draw it over the dusty mountainous roads, though one "iron horse" would hardly notice the weight of ten such loads.

OLD WAY AND NEW WAY MEET IN THE GREAT SAHARA

Camels have been "the ships of the desert" since earliest times, but, though they are so still, they are not now the only ones. Here we see two Beduins (one well muffled to protect his throat from sand), who have dismounted from their tall, ungainly steeds that they may better talk to the white men in their automobile with caterpillar tread.

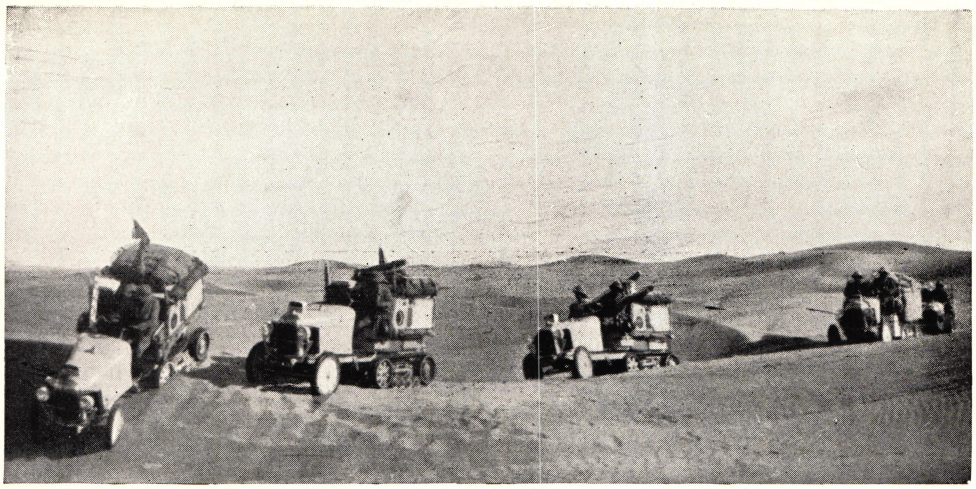
A husky dog is the hero of Jack London's Call of the Wild. The average sledge dog is no doubt but half domesticated. Yet these animals will often show the deepest devotion to their masters. Some members of the Northwest Mounted Police went on a surveying expedition for the government, but when they reached their camp it was found the provision box had fallen off the sledge and one of them went back with his dogs to pick it up. A terrible blizzard blew up, and when, three days later, a search party went out, they found the man lying dead in the snow with the leader of his dog team lying on his master's body, frozen stiff.

In Russia, also, sledges are frequently the only possible means of conveyance, but here the cold is not so intense as within the Arctic Circle, and so horses are employed to draw them. Horses, of course, are used all over the world where it is not tropically hot nor freezingly cold. Over the great grasslands of South America, for instance, where railways are as yet very inadequate, practically everyone rides a horse—even children going long distances to school.

In the desert country of Arizona, in the United States, two brothers who work a small gold mine have for some years past been using a "wind wagon" of their own construction to haul their ore to the nearest shipping point and to bring in their supplies. The sands are smooth and firm and the wind-driven vehicle travels at a speed of ten to fifteen miles an hour.

In many countries, especially those covered with tropical forests, the waterways are the only means of communication. In the huge basin of the River Amazon there are practically no railways serving an area of 2,722,000 square miles. There are few Indian trails through the almost interminable forests, and it is practically impossible to drive roads or railways through the dense jungle. The only means of communication is along the waterways, but it is as easy for a traveler to lose his way in this labyrinth of channels as it is in a desert.

It is the aeroplane that is making possible much of the surveying of the muskeg and lake region of northern Canada, where lies an all but unexplored region of bush and swamp. Air pilots have carried mail across frozen wastes.



MODERN CARAVAN AMONG THE BARREN SANDS OF THE SAHARA

One day a railway may carry goods over the Sahara. Motor cars have already won their way across, as they have across Gobi, though camels are still by far the most important means of transport. This laden motor caravan is crossing the stretch of sand between In Salah and Igostu. Special cars, with "caterpillar" back wheels, are built for the purpose.

Australian Commonwealth

ARABIAN CAMELS AND THEIR AFGHAN MASTER IN FAR AUSTRALIA

This is a rich caravan indeed, for every camel is laden with gold-dust and nuggets. It is bound for the coast from a gold mine in the Australian desert. Enormous areas of Western and Central Australia are desert, the mineral wealth of which has been made more accessible by the introduction of the Arabian camel, or dromedary.

Courtesy Department of the Interior, National Parks of Canada

SUMMIT OF A ROCK RIDGE LOOKING DOWN INTO MALIGNE CANYON, MT. BRAZEAU IN THE DISTANCE

Jasper National Park, in which this view was taken, is a wilderness of 4,400 square miles in the Canadian Rockies. The forests are so dense that they are guarded by aeroplane fire patrols whose machines can be made to land on the little tree-girt lakes. But the lakes themselves are bare, save where they are capped with snow; and the hunters and mountain climbers who would travel far through this haunt of bears and mountain sheep must transport their camp outfits on the backs of sure-footed pack-mules and themselves on horseback.

Ewing Galloway

ALASKA FUR TRAPPER WITH DOG-TEAM AND SLEDGE TRAVERSING THE SNOWY WASTES

Alaska has an area of close to six hundred thousand square miles, yet there are only about eight hundred miles of railroads, as contrasted with between seven and eight thousand miles of mountain trails. But there are also over a thousand miles of sledge roads which "husky" dogs and malamutes, both part wolf, drag mail, supplies, furs, game and travelers unable to make it on snow-shoes. There is even a dog car railroad along which, on narrow-gauge tracks originally built for a steam-engine, these animals draw platforms on wheels.

ACROSS THE SANDY WASTES that lie between the Indus River and the foothills of the Sulaiman Mountains in Southern Waziristan in northwestern India plods a long caravan of camels. It is on the road to Afghanistan, which it will reach by way of the Gomal Pass. This is a route of the Afghan merchants who every autumn leave their country to carry products brought to Afghanistan from Bokhara and Samarkand, in Russian Central Asia, to the rich markets of India. Travelers must keep close to the road which is little more than a trail in the shifting sands.

EDWARDES

IN AFGHANISTAN there are neither railways nor navigable rivers, and motor roads are few. Trade with neighboring countries is backward, though caravans travel over the passes of the bordering mountains both north and south. This caravan of asses laden with salt, picks its dangerous way along a rocky track often swept by sudden blizzards.

Dyott

THE ONLY WAY OF TRAVELING IN THAT VAST REGION OF FOREST AND STREAM, THE MONTAÑA OF PERÚ

Tropical forests are the principal barriers to road and railway construction in many parts of the world, but such regions are usually rich in waterways that take the place of both. In the Montaña of Perú, a great forest upland east of the Andes, are innumerable streams mostly tributaries of the greatest of all rivers, the Amazon. Some are now used by the white man's launches which ply between the settlements on the banks, but many small streams are known only to the native Indian, ever an expert waterman in dug-out canoe or raft.

THE STRENGTH OF RUNNING WATER

How Rivers, Great and Small, Shape the Land

Running water is one of the strongest forces in nature, for "constant dropping wears away a stone." Deep gorges, fertile plains, lakes and rapids are made by rivers. They break up huge rocks and turn them into silt; they reclaim land from the sea by building deltas and islands at their mouths—or they destroy life and property by flooding. They provide natural highways for man and beast, make port cities possible and suggest tribal boundaries which are often retained after centuries of civilization. Until the earth's surface is level their work will remain unfinished. Our pictures show the achievements of various waterways.

RIVERS are Nature's architects. At the end of the Ice Age, when the seas were drawing back toward the Poles and the glaciers to their fastnesses on the peaks, our present rivers came into being. Many of them, in their novitiate as land-carvers, guided by the deepest hollows of the hillsides and seeking the lowest level, ran into one another until their combined forces became fierce torrents. In the course of centuries they carved ever deeper entrenchments.

It might happen that some river, by cutting farther and farther into the mountain that divided its headstreams from those of another river, would at last break away that barrier every here and there. If now it had succeeded in carving a deeper valley than its neighbor, it would turn robber and despoil the second stream. This is the explanation of many a dry river-bed.

Sometimes a river flows through a plain encircled by high hills. Even that plain is the work of the river, for the stream came down from the mountains and formed a lake, this lake grew larger and deeper, possibly centuries passed, but always the river awaited its opportunity to escape. At last the water rose to such a level that it found an outlet over the lowest point of its imprisoning walls. Slowly the stream wore down the barrier, and at the same time the lake decreased in depth—until at last the bed of the river was on the same level as the bed of the lake. Then the lake drained away and its bed became a plain That has been, and no doubt will be, the fate of most lakes.

As it is the aim of all rivers to reach the sea, they must either remove obstacles that block their path or go around them. When they are rapid torrents rushing down mountainsides, they usually take the first course; when, nearer the sea, the slope of the river-bed lessens, they must resort to the latter. Thus we find that in a river's lower course it twists and zigzags.

When the river is rapid it carries with it all the rock and stone that has been ground to a fine powder. When it becomes more sluggish, it has not the strength to do so, and, dropping the silt, fills up its bed, becomes shallower, forms islands, divides into many channels, and at its mouth, makes what is known as a delta. That is how many rich coastal plains have been formed. Let us take as an example the Mississippi River. It is filling up its bed to such an extent that near its mouth it is actually at a higher level than the surrounding country. Were it not for the artificial banks that clever engineers have built, it would flood even more disastrously than it has done. The one best insurance against destructive floods and consequent dearth of water is of course the presence on mountain slopes of a forest cover. In the case of the Mississippi, various artificial means to flood prevention and control are being tried. Some floods, however, are beneficial. We have only to consider the Nile to realize how great is the value of seasonal floods; for its regular inundations deposit fertile mud on the arid agricultural lands. Other great rivers subject

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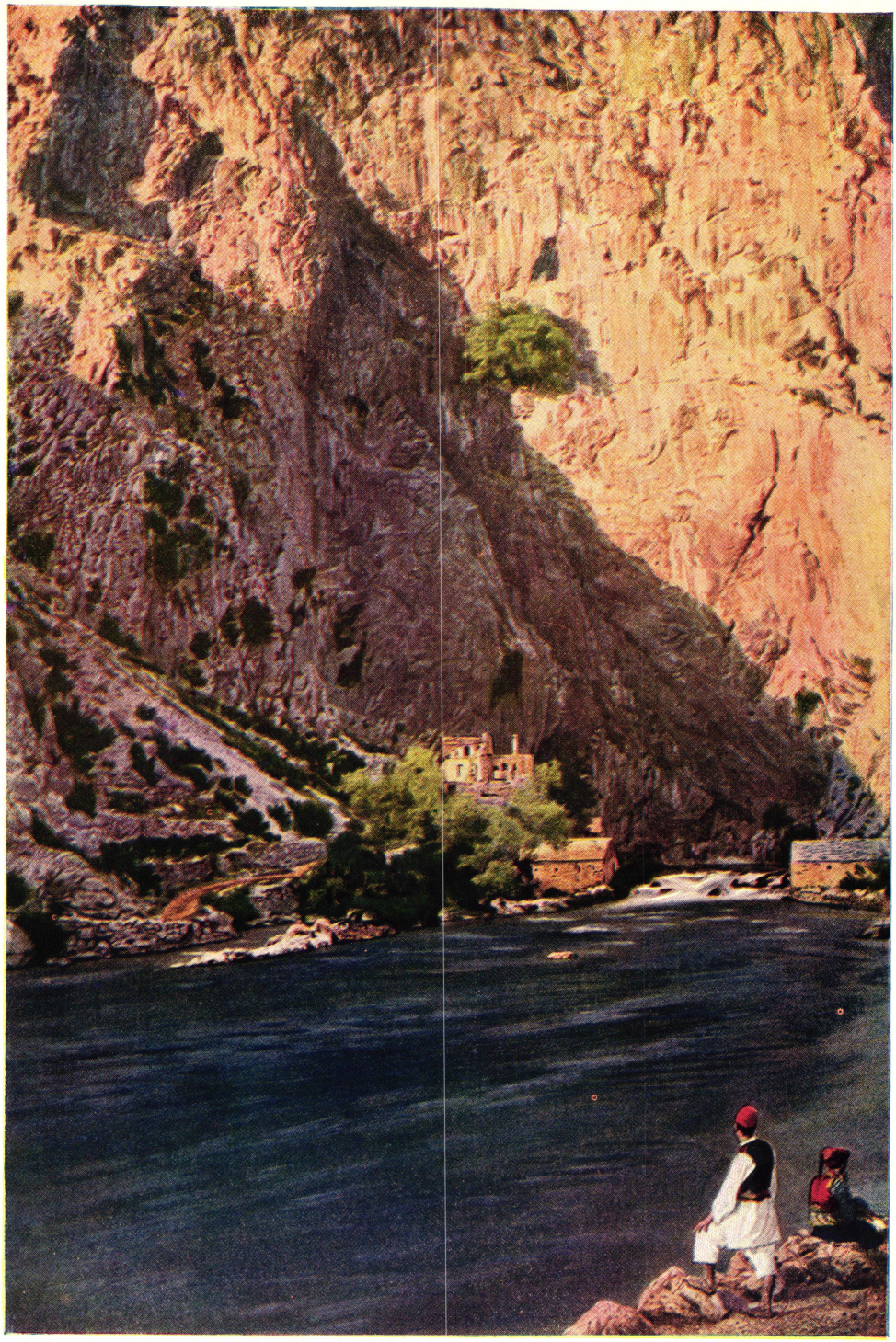
THE GORGE OF GONDO, through which runs the Divedro River, is an example of the carving power of swift mountain streams. Not only has this river cut a valley a thousand feet deep, but one of its head streams, in opposition to several other streams flowing northward, has been instrumental in forming the famous Simplon Pass, 6,592 feet high. Thus with the aid of several streams, surprisingly small for the work they have done, man has been able to build roads over the Alps along which traffic may pass between Switzerland and neighboring countries.



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BENEATH THIS PRECIPICE is a cavern, from out the mouth of which flows a river, the Buna, which has made its way underground, and which after a short course, falls into the River Narenta below Mostar. These sun-bathed cliffs and cool, clear waters are to be seen near Blagaj, a little Mohammedan village in Herzegovina.

to periodical floods are the Euphrates, the Ganges, the Indus and the Yang-tse-kiang.

If the hills are close to the sea, the rivers are short and rapid; if they are far from the sea, the rivers are long and sluggish, for the speed of the current varies in proportion to the steepness of the ground. When it encounters a sudden slope in its bed, an outcropping of hard rocks or a narrow defile, then rapids occur. But when the river encounters a mass of hard stone, the rock beneath which is comparatively soft, it carves its way beneath the barrier. If the rock over which the river flows in its early course is limestone, the river will carve a deep channel between precipitous walls.

How Rivers Avoid Obstacles

Rivers invariably twist around hard obstacles. If we draw a straight line from the source of the Rhine to its mouth, we shall find the distance to be about 360 miles. Yet the Rhine has a winding course of 600 miles. Three great rivers —the Yang-tse-kiang, the Mekong and the Salween—rise not far from each other in the lofty tableland of Tibet. They once flowed for much of their course over a plateau nearly twenty thousand feet high, but so deep are the trenches they and other streams have dug for themselves that they have turned the plateau into a country of enormous mountain ranges and forbidding gorges. These three rivers flow parallel for a distance of 170 miles, for about 130 miles of which they lie in a belt only 50 miles broad; yet they never touch, and their mouths, one in the Yellow Sea, one in the South China Sea and one in the Indian Ocean, are thousands of miles apart.

On the character of the rivers largely depends the situation of towns. Rivers that are long and sluggish are generally navigable and are often so deep near the sea that they provide anchorage for large ships. We have only to consider what the Thames has done for London. The Thames is an insignificant stream in comparison with the Danube or the Volga, yet it was the Thames that attracted the commercial instincts of the Romans and caused them to build their city of Londinium on its banks; and it is to the docks, warehouses and factories which its presence makes possible that the Port of London owes its position to-day.

Highways of Migration

As highways, rivers have always been of great importance. The Mississippi was the main road through the southern states of North America, from Minnesota to the Gulf, until the coming of the railway. The River Amazon affords practically the only highway through the dense forests of northwestern Brazil. It is indeed largely owing to the unceasing toil of innumerable streams, which are often nothing but insignificant trickles of water, that man finds passes across the mountains over which he can build roads and railways. Rivers are highways for plants and animals as well as men. With them they bear the seeds of the plants that grow beside their banks, to deposit them many miles away; and on natural rafts—torn from the bank during a flood perhaps—they carry land animals, who are thus led upon involuntary migrations.

Work of the Colorado

Perhaps no river has altered its bed more amazingly than the Colorado River. This two-thousand-mile stream, from the foot of the mountains among which it rises to its mouth in the Gulf of California, has a fall of about six thousand feet. Into it pours the water of a drainage area over four times as large as England and Wales put together, while it receives the water of seventeen rivers. For many miles this river and its tributaries flow through deep gorges—over a mile deep in some places, and from half a mile to fifteen miles wide. At flood times the water sometimes rushes along at twenty-five miles an hour. This extraordinary river is not yet satisfied with what it has accomplished, for it is still digging, and its canyon will be yet deeper before its work is finished. That will not be until it can flow at a uniform pace down an even gradient to the sea.

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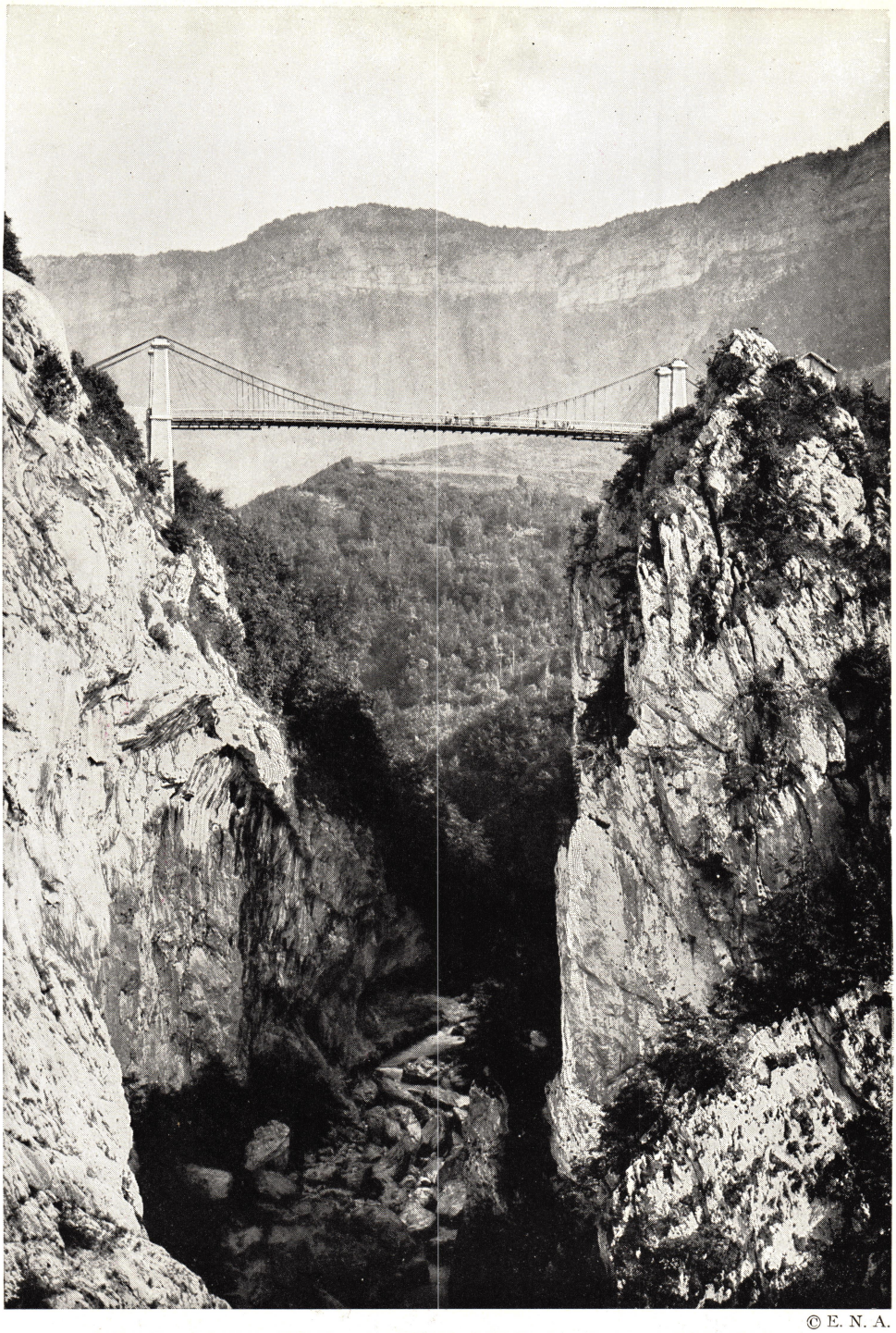
RIVERS OF ICE, vast glaciers moving imperceptibly for thousands of years during the Ice Age, scraped the sides of the Alpine valleys and deepened them by plucking and scouring material from their floors. In this way most of the valleys in the Alps acquired their characteristic shape. Many lake basins have been formed on the valley floors.

THE MOST MARVELOUS RIVER VALLEY IN THE WORLD

The gorgeously colored Grand Canyon of the Colorado River is considered to be the most amazing example in the world of river erosion. This great stream has carved itself a gorge through the Western United States 217 miles long and in some places more than a mile deep. Yet its work is not finished, for it is still engaged in deepening its bed.



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WHAT, GIVEN TIME, A TINY STREAM CAN ACCOMPLISH

The Alps contain many dizzy gorges like this of the Chéran, a tributary of the River Rhône and that of the Saaser Visp. When we see such a deep chasm in the earth's surface as the canyon shown above and remember that it has been cut by ice and running water, we realize how many countless centuries old the world must be.

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THE RIVER DRAC, which is responsible for this great gash in the surface of France, is not a mighty stream; it is only a tributary of the Isère seventy miles in length. The aim of all rivers is to reach sea level, and their carving of gorges is to that end. The greater the altitude at which a stream has its beginning, the greater the distance it must fall; therefore the greater its swiftness and power. The Drac rises in the snowy Dauphine Alps—that is the secret of its strength—where once there was probably an enormous tongue of glacial ice.

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THE POWER OF THE TARN is well illustrated in this amazing gorge, between La Malene and Le Rozier, of the Defile des Etroits, sixteen hundred feet deep. This French river and several others rising in the Cevennes once flowed across a wide plateau and fell in cascades over its edge. The ground was limestone and gradually they cut channels for themselves, so that the once flat tableland is now divided into many smaller ones separated from each other by deep and fertile valleys. The porous tablelands, however, are quite barren.

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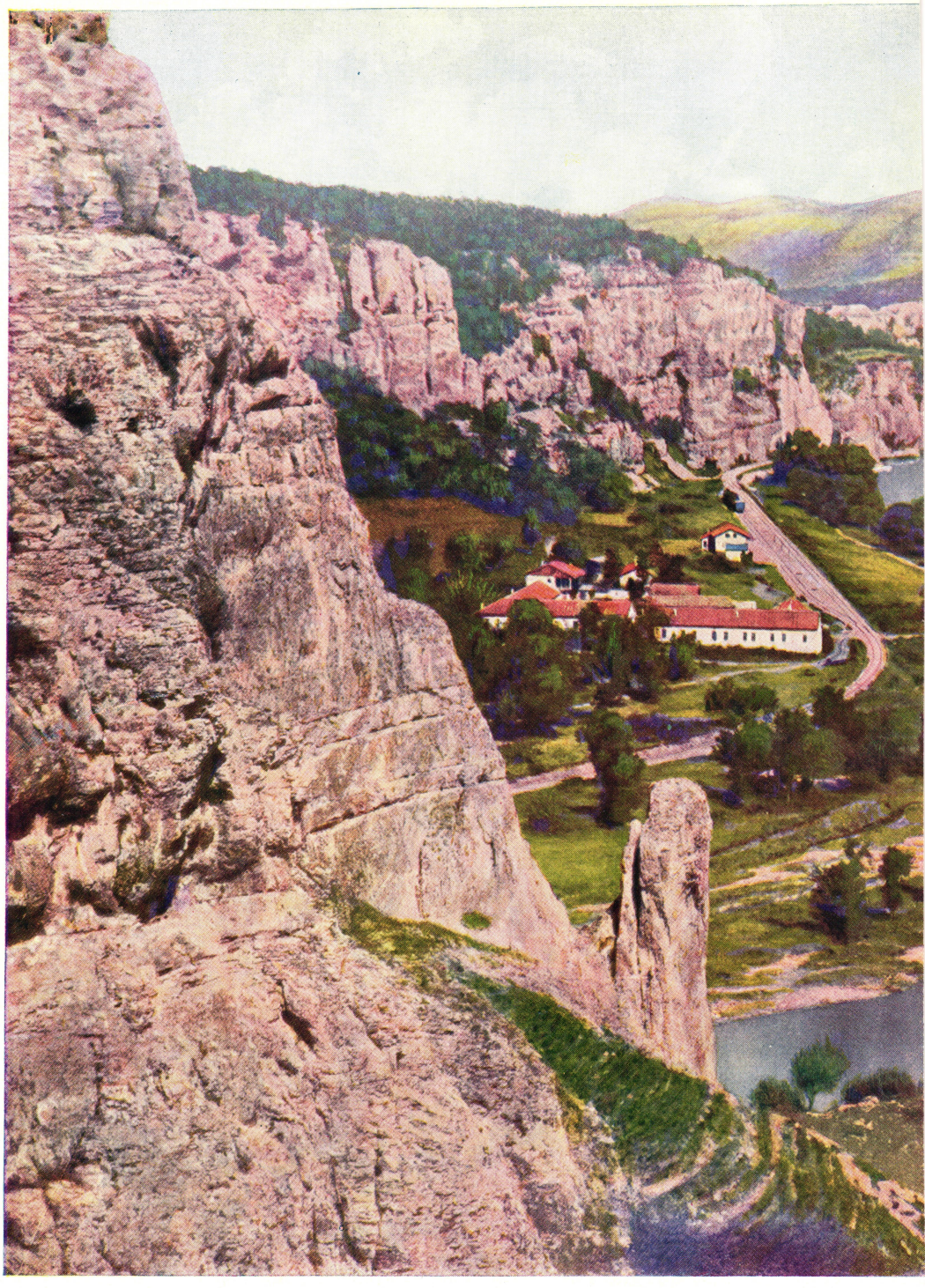
AN ALGERIAN RIVER WHICH, BY CUTTING A PATH FOR ITSELF, CUT A PASS FOR MAN

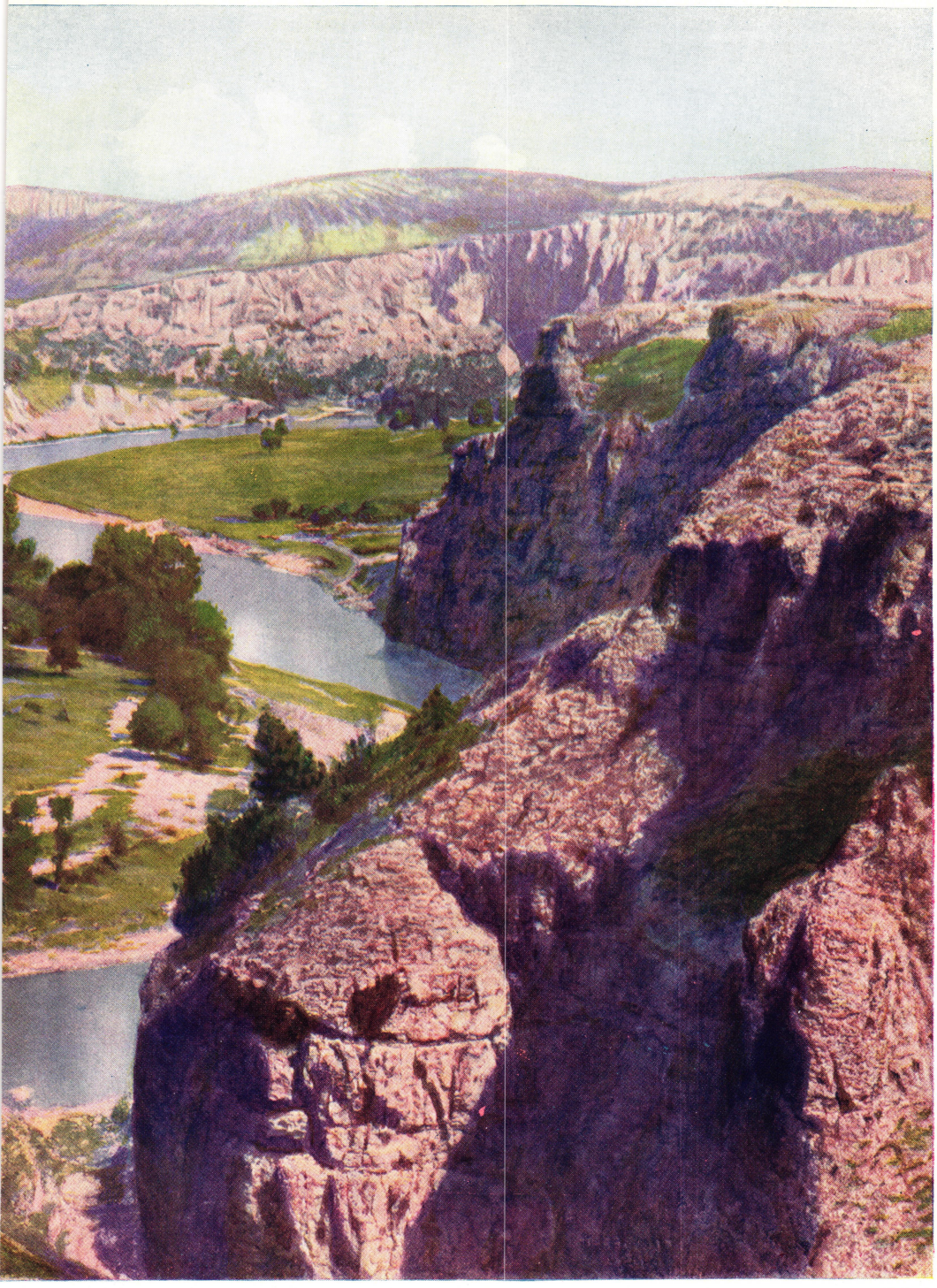
We all know how valuable a deep, sluggish river is as a means of communication, but few of us realize that occasionally a rapid torrent may be just as useful for the same purpose. Let us take, for instance, the stream shown above. Accompanied by road and railway it runs through the Great Atlas Mountains by the gorge of El Kantara. It is now rapid and winding and studded with rocks, small and seemingly useless; yet when it was a mighty torrent it cut this deep cleft through the mountain wall. Thus, thousands of years later, man was able to build his road.

A RIVER THAT HAS BEEN BOTH EXCAVATOR AND BRIDGE BUILDER: THE RUMMEL AT CONSTANTINE

The River Rummel, which protects the Algerian town of Constantine on all sides but the west, is not a large river; yet, by working unceasingly for countless ages, it has dug for itself a channel from five hundred to nearly a thousand feet in depth. The walls of the ravine are of limestone. This soft material is comparatively easily carved by flowing water. Here and there the stream has encountered a mass of harder stone: it has then dissolved away the softer material beneath and left the hard stone as a natural arch or bridge, as we can see above.



THIS VERDANT VALLEY, watered by the Bulgarian river Isker in its rapid descent, was once a lake. That is the way many a fertile valley began. A river may be blocked by ice or lava and a lake formed on the bottom of which sediments accumulate. In time, when the outlet has been cut down, the smooth bottom deposits are exposed and become the floor of



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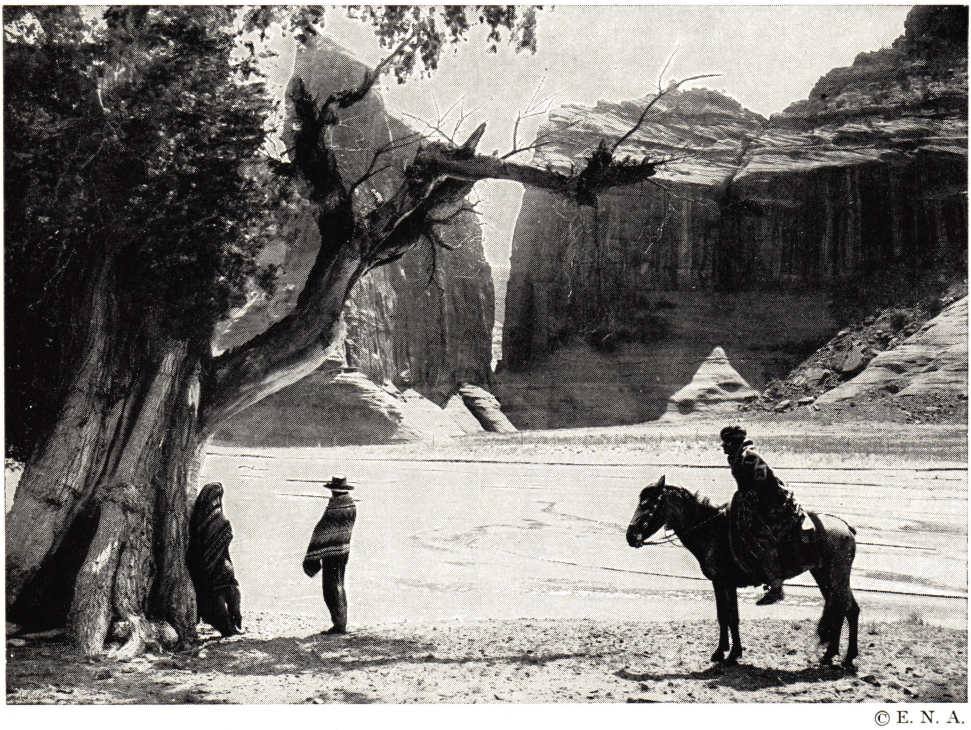
the fertile basin. Many such basins exist in different parts of Canada and the United States. Sometimes an underground river, by eating away a soft limestone stratum near the surface, will cause a subsidence, which appears to-day as a plain ringed about by cliffs. Such a collapse, in conjunction with severe earthquake, occurred in Yugoslavia in 1927.

Dyott

AN ANDEAN STREAM FOLLOWS ITS VALLEY TO THE SEA

A river takes advantage, in the beginning, of any depression. Yet this turbulent stream is responsible for much of the stupendous depth of this defile through the Chilean Andes.



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CANYON DE CHELLY, WORK OF A RIVER TOO WEAK TO REACH THE SEA

In the Colorado plateau is a stream which ultimately disappears into the ground; yet it was once strong enough to cut this amazing cleft through the lofty "butte," or plateau.

THE GREAT WASTE LANDS

Glimpses of the Regions Forsaken by Man

We usually imagine a desert to be a wilderness of sand or a monotonous plain, but this is far from accurate. In some deserts large areas are covered by an endless succession of dunes; but in others we shall find vast mountain masses and bare, rocky tracts. Deserts are regions in which few forms of life can exist, owing to the lack of sufficient rain, and the largest are to be found in Africa—the Sahara and Kalahari deserts—and in Asia—Arabia, Persia, Mongolia, Turkestan, Siberia and Tibet—though North and South America and Australia contain deserts also, not to speak of the barren regions at Greenland and Antarctica. Some deserts were formerly under water or were fertile lands supporting a large population. In this chapter we shall read how deserts are formed and learn something of the mysteries they guard.

WHEN we think of a desert, we generally imagine it to be a waterless, treeless expanse of sand, quite devoid of any sign of life. This idea is, of course, quite incorrect, for all deserts contain some oases—fertile spots that provide enough water to support human and animal life. And despite the hardships and discomforts of the desert life, those who venture it seem to find it strangely fascinating.

Were we to visit various deserts we should observe many strange things—storms without rain; rain clouds from which no moisture falls; rivers that disappear into the sand; seas that shrink or grow larger for no obvious reason; lakes with no outlets that are so highly impregnated with salt that they do not freeze in the coldest winter; waterless river-beds and plants without leaves.

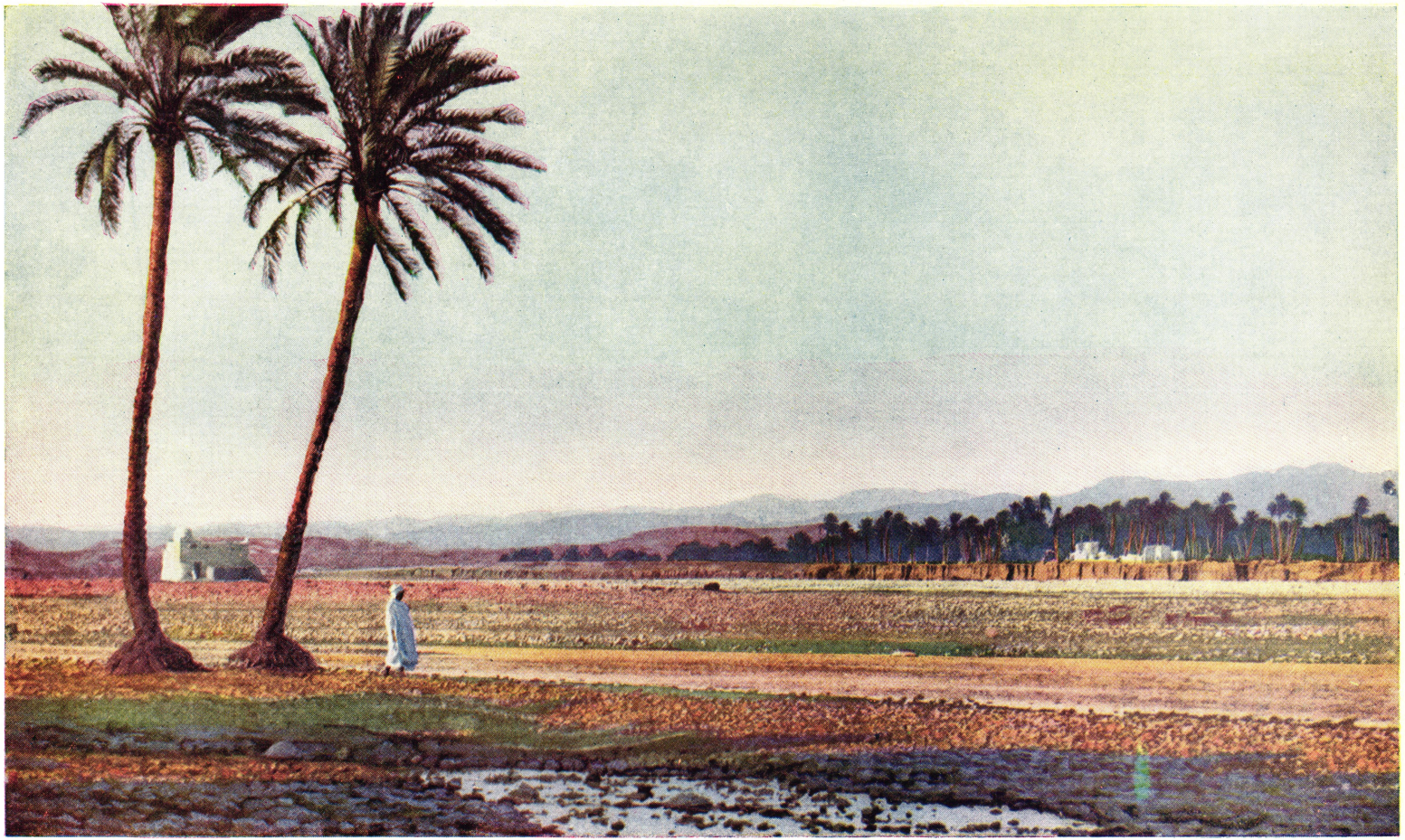
One curious thing found in a desert is described by an explorer in Libya. He tells of an oasis where there was an enormous number of snails, which lay so thickly upon the ground as to give the appearance of a light fall of snow. Another mystery of the desert is the mirage. About an hour after dawn in the southern Libyan Desert a mirage regularly reveals the country lying from twenty to seventy miles ahead. The Arabs call this optical illusion "the country turning upside down."

Deserts are among the most interesting places upon the face of the globe. Like the sea, some of them give travelers an impression of infinity, with their vastness and overwhelming solitude, and they present to them a wonderful contrast with the crowded cities and busy countryside of civilization.

Some deserts are in the lee of mountain ranges, so that by the time the rain-bearing winds have reached them they have discharged most of their moisture. It is to this fact that they owe their origin and their peculiar characteristics of desolation and sandy waste. Then there are the trade-wind deserts like the Sahara. But no desert is rainless, and all have an occasional "wet" season when grass grows more thickly than is the rule.

It was once thought that deserts were plains of smooth sand which, ages ago, lay at the bottom of the sea, from which they were long ago raised by upheavals of the earth's surface. Scientists tell us, however, that the sands of most of the large deserts of the world, as we find them to-day, have been formed by the breaking-up of rocks.

When a rock gets very hot—as it would when exposed all day to the heat of the sun—it expands; when it becomes cold again it contracts. In a relatively dry atmosphere the sun's rays, beating down with great intensity, have such abnormal strength that the nights are correspondingly cold. The change from intense heat to cold is very sudden, and the rocks expand and contract so rapidly that they split. The pieces split again and again and again, until at last the rock becomes sand, the fine particles of which are blown about and into hills and dunes by the wind.



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THE BARBARY STATES all merge, on the south, into the great Sahara Desert; oases, at first frequent, become fewer and fewer, until uninhabited country lies before the traveler. The oasis shown above, Gafsa, or Capsa, in Central Tunisia, like many other towns of North Africa, was once a Roman settlement. It has hot springs, and to the west of it lie large beds of phosphate that make the desert, often so useless to man, a source of wealth. Gafsa lies not far north of the low-lying Chotts, or salt pans, which here border the Atlas Mountains on the South.

© LEHNERT & HARDROCK

THE SANDS OF THE SAHARA are rarely smooth and flat. Among the dunes are miniature hills and valleys, sharp-edged ridges and cup-like hollows the contours of which are forever shifting. Should one of the dreaded sandstorms occur, this long yellow ridge, that casts so deep a shadow now that the sun is low, may disappear entirely; the strong wind may raise the dry sand and powdery dust high in the air until they resemble a thick wall. A caravan caught in such a suffocating storm must lie close to the ground until the air clears again.

INTRICATE PATHS THAT LEAD NOWHERE

Here the Sahara appears to be a boundless sea, broken only by wave-like mounds of sand. This appearance is confined to certain sections as the regions of sand dunes occupy only about one-tenth of the entire area. The desert contains rocky plateaus, vast tracts of loose stones and pebbles, mountain ranges of different types and valleys, as well as fertile oases. The northern portions of the Sahara are inhabited by tribes of nomad Arabs; the oases and certain of the mountainous districts have a settled population that subsists by agriculture.

The sands of the desert may be compared with the dust that forms on our own high roads during a long, dry summer. But when the autumnal rains and storms of winter come all this dust is washed away, only to be renewed when summer returns. In a desert no such removal is possible; there is only the wind to blow it from place to place. The sand increases year by year, owing to the disintegration of the solid rock that is continually being exposed by the wind.

Deserts Likened to the Sea

Just as the camel has been poetically called the "ship of the desert," so may a huge expanse of sand, such as the Sahara, be likened to the sea itself. Its surface, lashed by fierce gales, sometimes rises in waves of sand which move before the wind.

Sometimes, too, whirlwinds will sweep over the desert and raise mighty pillars of sand that may be compared with the water-spouts of the ocean. Twenty or thirty of these sand-spouts have been seen at the same time, all moving in the same direction and their tops reaching almost to the clouds. Oases—still to compare the desert with the sea—are fertile islands without the existence of which travelers could not cross the vast ocean of sand.

At these havens the thirsty and wearied travelers find refreshment for themselves and their camels, are enabled to refill their water-bottles and to recover their strength for the next stage of their weary journey. But it should be remembered that an oasis can sometimes betray the traveler by vanishing entirely. In 1803 a caravan proceeding from Timbuctoo to Tafilet, in the Atlas Mountains, reached an oasis only to find that the water had disappeared. Two thousand human beings and 1,800 camels perished.

Vast Deserts of the World

All deserts do not consist of unbroken tracts of sand. Sooner or later stone-strewn wastes or even outcrops of solid rock will be encountered, and often, as in the Libyan Desert and the Sahara, we may find mountain ranges rising to a height of many thousand feet above the level of the plain. Sometimes such mountains cause rain to fall and so their valleys are often fertile. Hence in many so-called deserts there are tracts which are capable of supporting a large population.

Perhaps the most famous desert in the world is the Sahara Desert of North Africa, which stretches from the Atlantic to the Nile and from the south of the Barbary States to the region of the River Niger and Lake Chad.

An almost uninterrupted series of deserts stretches eastward from the Nile through Arabia, Mesopotamia and Persia. Then, by means of the more or less desert-like tracts of Baluchistan and Sind, we reach the Thar, or Great Indian Desert, in Rajputana. Northeast of the Thar, across the Himalayas, lie the barren plateau of Tibet, the Gobi Desert of Mongolia and other wastes of Central Asia.

In South Africa is the Kalahari Desert. North America possesses in the southwest such barren regions as the Painted, Gila and Mohave deserts; and in the southern continent of America there is the desert of Atacama, stretching along the border of Chile and Perú and the Peruvian coast. Almost the whole of the interior of Australia is desert.

Tibet a Cold Desert

Most of Tibet is more or less desert. It is a wild and mountainous region with an average elevation of about 14,000 feet, which makes it one of the coldest desert regions of the world. Tibet is a waste and is, for the most part, bleak and forbidding, the rainfall being so scanty and the atmosphere so dry that the nails and skin may split. Freezing winds sweep across this inhospitable land and raise up great whirlwinds of dust.

Nevertheless, there is an abundance of animal life. Yaks, gazelles, goats, marmots, wild asses and hares are to be found on the higher mountains, for even here they find grassy pastures in summer. The yaks will wade into icy lakes to feed

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THE SINAI PENINSULA, that inhospitable triangle of land nearly the size of Ireland that joins Arabia to Egypt, is the desert through which the Children of Israel wandered after the Exodus. It is even more barren now than it was then, for the few trees that used to grow upon it have long since been cut down. This bare, rugged mountain rising steeply from the plain is called Jebel Musa—the Mountain of Moses—though it is a moot question as to whether such a waterless plain surrounded the mountain upon which Moses received the Law.

on the waterweed that grows on the bottom. In considering the forms of life that may be found in the most utterly barren land, it is interesting to learn that the Mount Everest Expedition found small spiders, living on islands of broken rock in seas of snow and ice, at a height of about 23,000 feet above the sea. There was no vestige of any other living creature or vegetation near them. For food they ate one another!

The sun-glare on the sandy plains that form so much of the northwest of the Indian peninsula is so unceasing that it is said that, even before the British introduced the heliograph signaling system into India, the prices of grain in the Punjab were signaled by mirrors across Rajputana to Sind and Bombay.

Wastes of Northern Siberia

Across the north of Siberia, within the Arctic Circle, stretch the Tundras—marshy moorlands and immense tracts of treeless swamps. These marshes are largely uninhabited and for several months out of the twelve are difficult to cross.

June and July, however, are two months of continual day, when the sun is very hot indeed. The rivers open by late spring; the snow disappears; and vast fields of buttercups, dandelions, forget-me-nots and other flowers are to be seen. Acres and acres of crowberries and cranberries ripen toward the end of the Arctic summer, and the air is full of mosquitoes and flies.

If the berries do not ripen till the end of this strange summer of continual daylight, upon what do the fruit-eating birds live? Here we encounter an almost incredible fact—the birds live upon last year's fruit! When the summer comes to an end much of the ripe fruit still remains, and throughout the bitter winter it is preserved by a natural cold-storage system.

Deserts Not Unchanging

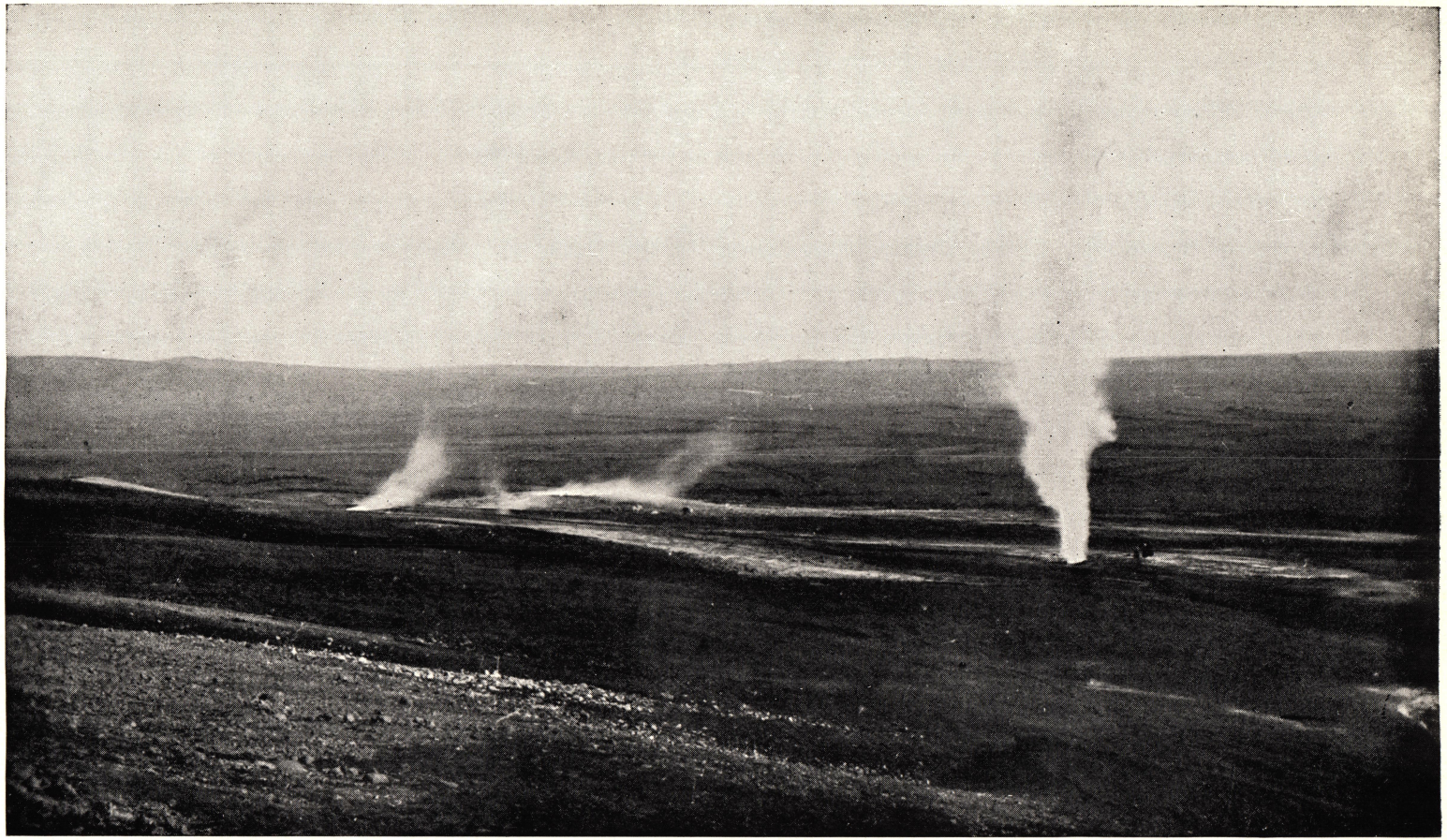
Because an area is now an arid desert, it does not follow that it always has been and always will be. In the heart of the Sahara are great depressions and valleys that once were undoubtedly occupied by large rivers. In the deserts of Persia and elsewhere there are lakes so salt that their water is undrinkable, and stretches of ground encrusted with salt; these districts were once inland seas that are now almost entirely evaporated. In southern Arabia and in Sin-Kiang travelers have discovered, buried in the sand of the deserts, ruins of once mighty cities.

Scientists have also virtually proved that mankind originated in the plateau of Central Asia, which is now, to a great extent, desert land. We know for certain that during the dim and distant days of the Stone Age human beings dwelt on the shores of the large lakes and rivers that were then to be found on what is now the barren Gobi Desert. That this land must once have been able to support life on a larger scale is proved by the fact that an expedition which, in 1922, set out to explore this inhospitable region, discovered not only the eggs, but excellently preserved skulls and skeletons of dinosaurs—monstrous prehistoric reptiles.

Land Dunes of the Gobi Desert

The Gobi Desert has comparatively few oases. It extends for a distance of about 1,500 miles from east to west and about 600 miles from north to south, the greater part of it being occupied by large stretches of sand dunes that are unrelieved by any form of life. We can get a vivid idea of this barren land by looking at the photograph in the article on Mongolia.

That deserts may be reclaimed has been proved by the fact that many former desert areas are now being profitably cultivated. Desert soils are especially rich in potash and lime—chemicals that are splendid fertilizers—and where a river crosses a desert, irrigation can usually be carried on with great success. This has been done in the valley of the Nile and in parts of the Great Basin of North America. But if the river has cut a deep channel in the rock and flows far below the surface, artificial irrigation becomes too expensive to be profitable. In parts of the Australian Desert artesian wells have been sunk successfully.



Gunnarsson

SPOUTING GEYSERS IN A DESOLATE LAVA FIELD OF SOUTHWESTERN ICELAND

This gloomy stretch of land is not, like most other deserts, barren because it lacks water; a river flows through it and it is rich in many springs. These springs are hot, but so are those of Gafsa, which, nevertheless, make the district fertile. This land is desert because it is covered with a lava flow, as are thousands of square miles in Iceland, which is a volcanic island. The surface lava powders into a fine sand that, being carried by the wind, travels for long distances and renders sterile land that would be fertile if it did not have this covering.

Sykes

ON THE ARID STONY DESERT OF KHORASSAN, THE PERSIAN PROVINCE THAT BORDERS ON TURKESTAN

Persia, once the heart of a mighty empire, is to-day a land of deserts, where rainfall is light and rivers are few. In the Great Desert of the interior there are no rivers at all; the few lakes are very salt and drinking-pools are few and far between. So few are they that it is not wise for anyone to venture into the desert unless he knows where they are to be found. These pastoral nomads, with their horses and pack camels, are well acquainted with the desert. They are bound for the mud-village of Kupkan, among the mountains of Khorassan.

Dyott

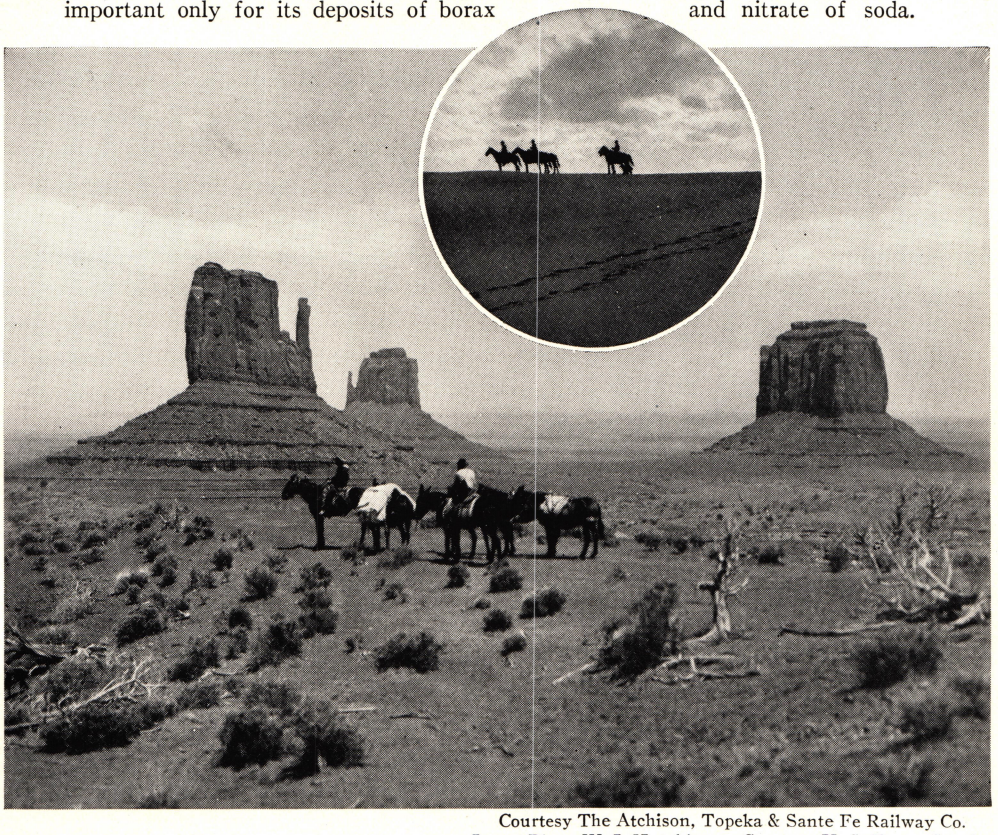
GLIMPSE OF THE DESOLATE RAINLESS LAND THAT LIES BETWEEN PRODUCTIVE PERÚ AND THE PACIFIC

The coastal zone of Perú is one of the most desolate places imaginable, a sandy waste studded here and there with rocks, behind which rise the towering Andes. Rain falls but uncertainly—or falls so rarely as to be useless—and thus there is little or no vegetation. This photograph shows us a particularly favored stretch of desert near Pacasmayo, for here, beneath the sand, flows a stream. We can mark its course quite clearly by the line of shrubs that grows above it. The soil is fertile enough to produce good crops; water only is lacking.

© Willard, Courtesy Union Pacific System

SAND DUNES IN DEATH VALLEY, CALIFORNIA

This desolate region received its name after a party of "forty-niners" perished here. Almost fifty miles long, surrounded by high mountains, bare and brilliantly colored, it is unsurpassed for combined heat and aridity. Practically all the year, the valley presents a desolate waste, important only for its deposits of borax and nitrate of soda.



Courtesy The Atchison, Topeka & Sante Fe Railway Co.
Inset: Photo W. I. Hutchinson, Courtesy U. S. Forest Service

CROSSING DESERT LANDS IN WESTERN UNITED STATES

We may be sure that these travelers will not remain many days in Monument Valley, Arizona, particularly if the season is late summer. During the spring rains scrubby patches of mesquite rise from a sea of delicate grasses and flowers. The inset is of San Luis Valley, Colorado.

© Ewing Galloway

DESERT THAT A LITTLE WATER WOULD TURN INTO A GARDEN

In the state of Arizona and in other western states, there are stretches of land which lack of rainfall has turned into arid desert, bearing only sparse scrub and that curious American plant, the cactus. Wherever irrigation has been introduced, however, this forbiddingly sterile desert has been turned into fruitful farms and orchards.

Although the Kalahari Desert of South Africa contains seemingly endless expanses of sand, and although rivers are unknown and its sands had the same origin as those of other deserts, there are periods of the year when parts of it could most certainly not be called desert. To quote one explorer: "During the brief weeks of rainfall no land can assume a fairer or more inviting aspect. The long grasses shoot up green, succulent and elbow-deep; flowers spangle the veldt in every direction; the air is full of fragrance, and pans of water lie upon every side. Another month and all is drought."

The same applies to parts of the Arabian Desert, that, for a short time, provide the wandering Beduin with pasture for his herds. These facts and the fact that, wherever there is a spring in the Sahara, a grove of fruitful date-palms is found, all prove that desert soil is often far from sterile, and only water is needed to make it "blossom like the rose."

THE WONDER OF THE WATERFALL

World-famed Scenes of the Thundering Waters

Perhaps it is not surprising that many famous sights disappoint us when we first see them. We have heard so much and read so often about them that we form great ideas in our mind, and when in later years we have the good fortune to stand before them we somehow feel that they do not come up to our mental pictures. But this is not so with Niagara. No description, no picture, can exaggerate the majestic beauty, the fascination of the famous falls. The pictures shown here of these and other falls both in North and South America, as well as in Europe, compel interest and admiration, and show that waterfalls must be classed among the most pleasing features of Nature. This chapter on waterfalls in many lands explains how they come into existence and why the great falls tend to move nearer and nearer to the source, many times a lake, from which their waters flow.

MOVING water, in its various forms, plays an important part in connection with the changes, large and small, which the earth's surface is always undergoing. The slow-moving glacier, working by means of the gravel and bowlders which it rolls along, carves out and smooths down the ground over which it travels, while rain washes away the hills, and the sea is ceaselessly at work along the coastline. But more important by far is the action of water in the shape of torrent, stream or river.

If all rocks were equally hard there would be nothing to prevent a watercourse from making for itself a valley of uniform width with sides of equal steepness and with a valley bottom of the same slope from the source to the sea. As, however, there are layers or "strata" of varying hardness, this gnawing-out process or "erosion" goes on more rapidly in some places than in others, with the result that during its course a river may slide smoothly over hard rock, may be confined within a gorge where the stone is soft enough to be eaten away quickly or may wind in a wide valley where the soil is earthy and level.

In dealing with waterfalls we are specially concerned with those conditions which prevent a river from making for itself a valley bottom with a uniform slope. These conditions may be best illustrated by a description of the world's two most famous waterfalls, Niagara Falls and the Victoria Falls of the Zambezi.

Under the name "Ongiara," Niagara Falls appear on Sanson's map of Canada, published in Paris in 1657; but the first white man to see them was Father Hennepin, a member of La Salle's expedition for the exploration of the Mississippi (1678). He describes them as "a vast and prodigious cadence of water, which falls down after a surprising and astonishing manner, insomuch that the Universe does not afford its parallel. The waters which fall from this horrible precipice do foam and boil after the most hideous manner imaginable, making an outrageous noise, more terrible than that of thunder."

This "outrageous noise, more terrible than that of thunder," gave the falls their name, for Niagara is an Indian word which means "thunder of waters." The Niagara River runs from Lake Erie into Lake Ontario, a distance of nearly 25 miles. The difference in level between the two lakes is a little over 300 feet, of which more than half occurs at the falls. Probably not less than 25,000 years ago, possibly more, the river ran from Lake Erie right across the plateau to the edge of a steep drop about five miles from Lake Ontario, and Niagara Falls were thus within a few miles of Lake Ontario. Since then they have receded upstream a distance of over seven miles to their present position.

This receding or "cutting back," which may be taken to average about five feet a year, is a result of the formation of the

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WHERE THE LAJA FOAMS DOWN FROM THE SNOWY ANDES TO THE PACIFIC OCEAN

The Laja is a river in Central Chile, and forms the boundary between the provinces of Biobio and Concepción. It flows out of Lake Laja in the Andes to join the River Biobio at San Rosendo. Chile is full of beautiful cascades because, as a glance at a map will show, the country is a long and narrow strip between the tremendous range of the Andes and the Pacific Ocean. Hence the rivers, fed mainly by the melting snows, have to descend thousands of feet in a comparatively short distance during their journey to the sea.

rocks. The upper plateau is covered by hard limestone overlying softer strata. The backwash of the actual falls, by wearing away these shales, undermines the layer of limestone, fragments of which break off from time to time. While the upper part of the river does not deepen its bed to any great extent, a gorge, from 200 to 300 feet deep, has been formed below the falls.

As the falls move upstream, the gorge is further hollowed out, so that, after a period which has been calculated at about 50,000 years, it will extend right up to Lake Erie, and be three times its present length.

A good example of the end of such a process is presented by the Rhine Valley between Basel in Switzerland and Cologne in Germany. From Basel to just below Mainz the Rhine flows through a plain. Thence, to a short distance above Cologne, the valley is narrowed to a gorge. Ages ago the upper reach, now a wide plain, was a lake. Its waters gradually worked their way through the Rhenish Slate Mountains. Probably there were falls "cutting back" as we see Niagara doing to-day. When the Rhine gorge reached its present extent, the lake was drained and became a fertile plain. The Victoria Falls of the Zambezi have a very different geological history.

How Victoria Falls Were Formed

Ages ago the great Zambezi River, over a mile wide at this point, flowed placidly through a wide plain, beneath which was black basaltic rock. One day, possibly through some volcanic convulsion such as an earthquake, an enormous crack opened in this hard rock, extending from bank to bank across the river-bed. One of our pictures shows this chasm viewed from its eastern end—in other words, the left bank. The lips of the crack are still quite sharp, and the walls go sheer down from them. This rift, nowhere deeper than 350 feet, and varying in width from 80 to 240 feet, would soon be filled by the river. Here is Livingstone's description of what happened: "When the mighty rift occurred, no change of level took place in the two parts of the river thus rent asunder, consequently the river suddenly disappears, and we see the opposite side of the cleft, with grass and trees growing where once the river ran."

In fact, after filling up the chasm the river still continued its course over the plain, until it happened that the water was able to find a weak spot even in the hard basaltic rock where old cracks had been filled with softer material. Thus immediately beyond the first curve of rock, on the left of our picture, there opens a narrow gorge about 100 feet wide and 400 feet long. From this point the river has, in the course of ages, worked its way through the hard rock, forming a zigzag series of canyons 40 miles in length.

Niagara and Victoria

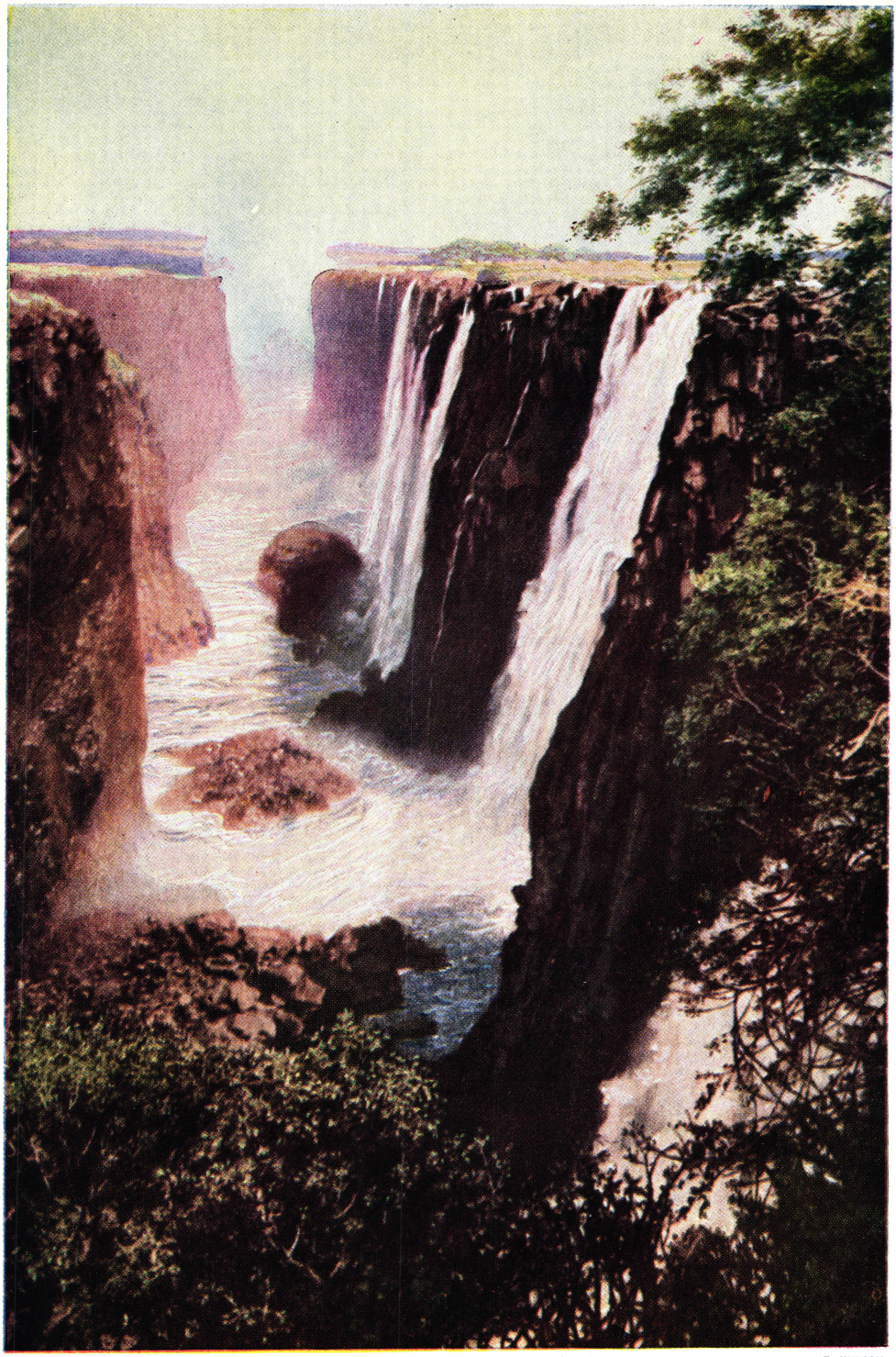
Though the final result—falls and gorge—is in both cases similar, there is one great difference. There has been a Niagara Fall, ever since there has been a Niagara River. Victoria Falls only came into existence when the river had found a way out of the crack, and had carved out the great zigzag gorge. Niagara Falls, as we have seen, are moving slowly upstream. But the basaltic rock of the Zambezi is too hard to be undermined by the mere backwash of the falls, which therefore remain much where they were when they first came into existence.

Niagara and the Victoria Falls show us the gnawing-out power of water on its most tremendous scale. The processes we have studied in detail in connection with these two are further illustrated by the pictures given of other well-known waterfalls in various parts of the world.

Falls in Other Lands

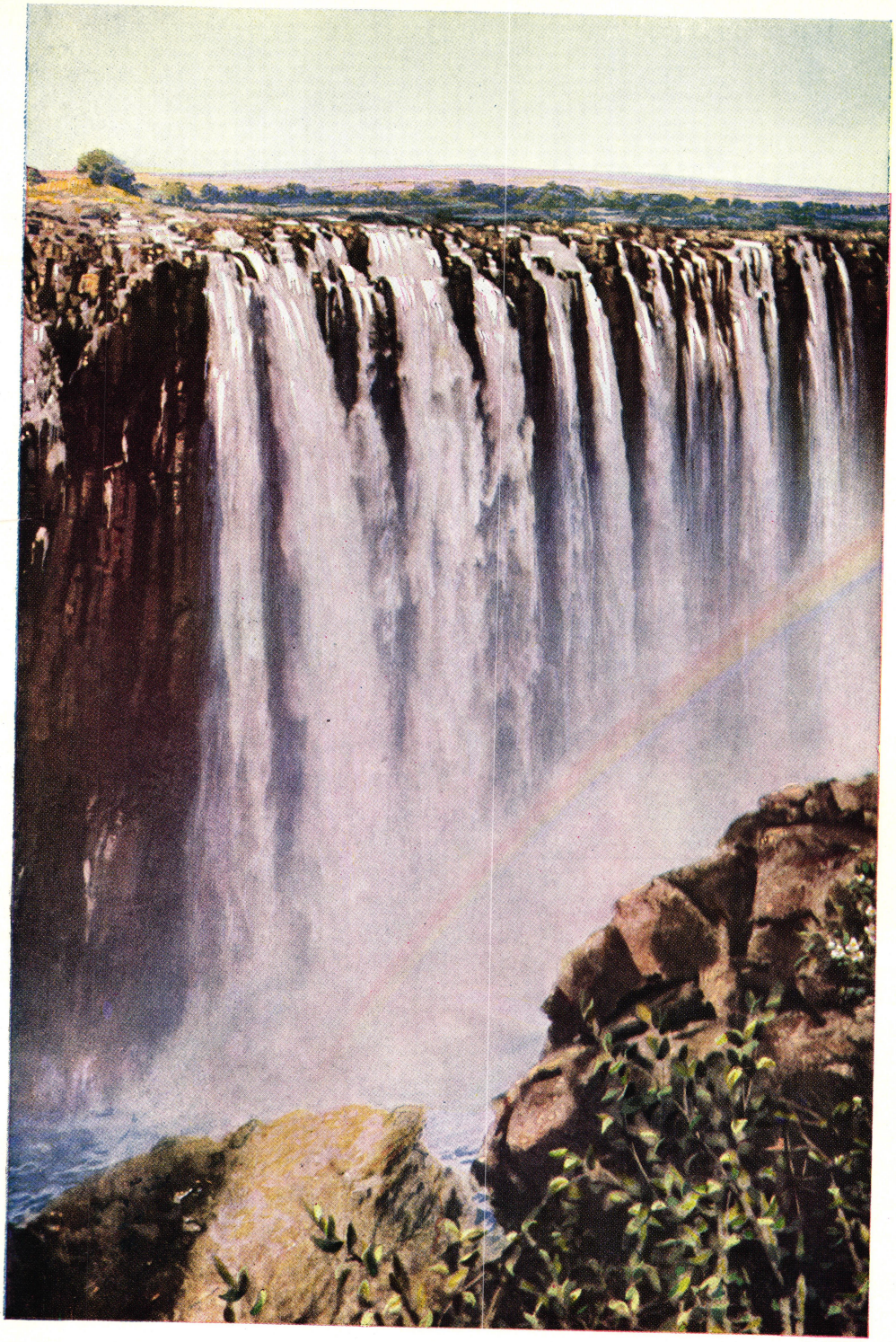
Still, the falls of the Laja River in Chile look distinctly like a small-scale Niagara. But even a river of the size of the Sharavati in India may be so broken up by the nature of the ground as to produce a number of cascades.

The total amount of energy developed by Niagara has been estimated at 5,000,000 horse power, of which possibly three-fourths might be made practically



E. HUDSON

VICTORIA FALLS in South Africa, known by the African natives as "the smoke that thunders," were discovered by Livingstone in 1855. They consist of several cascades, which hurtle into the narrow gorge of the River Zambezi shown above; and during the rains the columns of vapor that arise from their foaming vortices may be seen twenty-five miles away.



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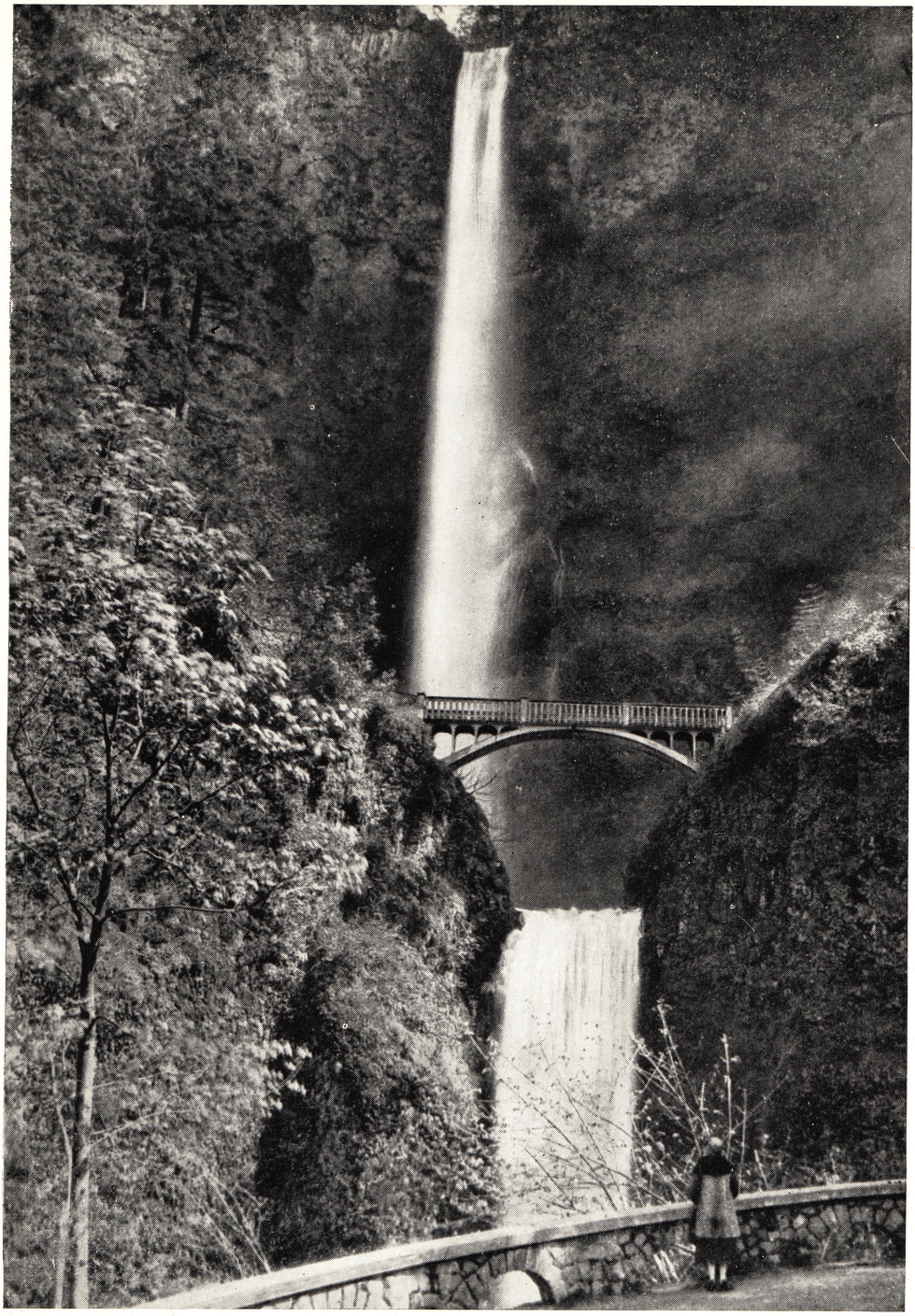
THE RAINBOW FALL is the widest of the four which together make Victoria Falls in Africa. The chasm into which the falls thunder beneath rainbow spray is more than twice the depth of Niagara, and the waters of the Zambezi River strike against the opposite wall of the gorge, before entering the forty-mile Z-shaped stretch of the main canyon.



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MULTNOMAH FALLS: HOW A TRIBUTARY JOINS THE COLUMBIA

From Portland, Oregon, the journey up the Columbia River to The Dalles, a town on the south bank, can be made either by road, rail or water. The river cuts through the Cascade Mountains in a fifty-mile gorge, and at one point the Columbia River Highway and the railway cross a tributary stream which drops in two cascades of 605 and 67 feet.

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GERSOPPA FALLS: INDIA'S LOVELIEST CASCADE

In the North Kanara district of Bombay the River Sharavati flows over a great cliff on its path through the range of the Western Ghats to the Arabian Sea. The four cascades are known as the Rajah, the Roarer, the Rocket and the Dame Blanche, or White Lady. The cliff is 830 feet high and the pool below the Rajah 132 feet deep.

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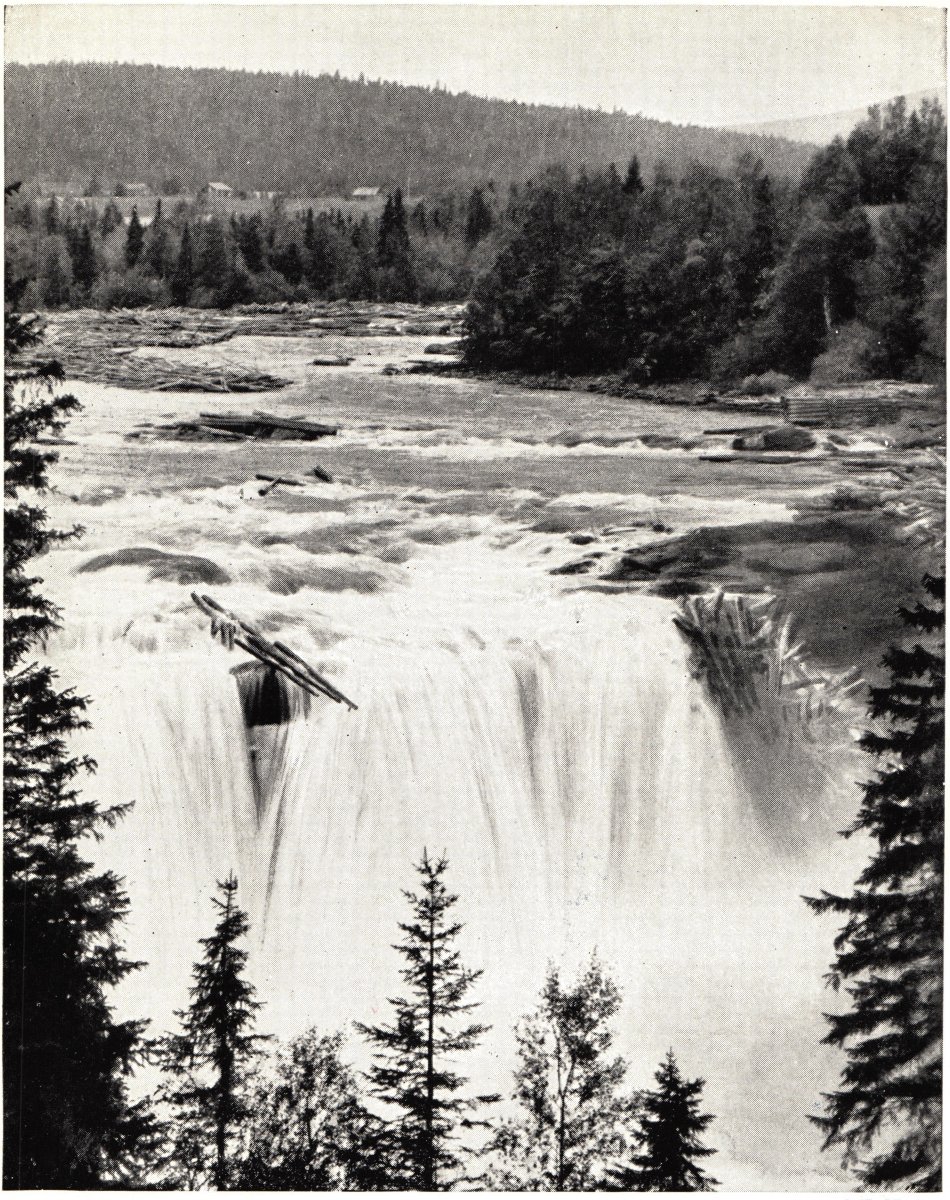
TWO RIVERS MEET below the red roofs and old castle of Jajce in mountainous Bosnia. The Pliva goes winding past the towns, then suddenly drops ninety feet into the Vrbas, a tumultuous tributary of the Sava, which in its turn joins the Danube. The deep music of the main fall is accompanied by the softer notes of several smaller cascades.

THE SEVEN SISTERS drop in a graceful veil of spray from the side of the Geiranger Fjord, one of the narrow fjords or inlets which pierce the coast of Norway. To reach this cascade one starts from the seaport of Alesund and goes by steamer through miles of fjords, which in places are shut in by steep precipices hundreds of feet high.



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GREAT RAFT OF LUMBER LEAPING THE RISTA FALLS

Sweden produces vast quantities of timber every year, for about half the total area of the country is forest land. The logs of pine and spruce are felled and floated down the rivers to saw and pulp mills. In the photograph an enormous mass of logs is seen sweeping round the bend, while another mass is dropping over the brink of the falls.

available, not, of course, without spoiling the beauty of the falls and ruining them as a tourist attraction. As it is, several power-distribution companies on both sides of the river are already exploiting the falls in this manner. This is done by means of canals and tunnels which start a mile or two above the falls and lead the water to great turbine engines, connected to dynamos, below the falls. Electricity so generated is conveyed considerable distances by high tension cable lines to supply light to cities, and power to industrial plants.

SPINNERS AND WEAVERS

Folk Who Practice Man's Oldest Handicrafts

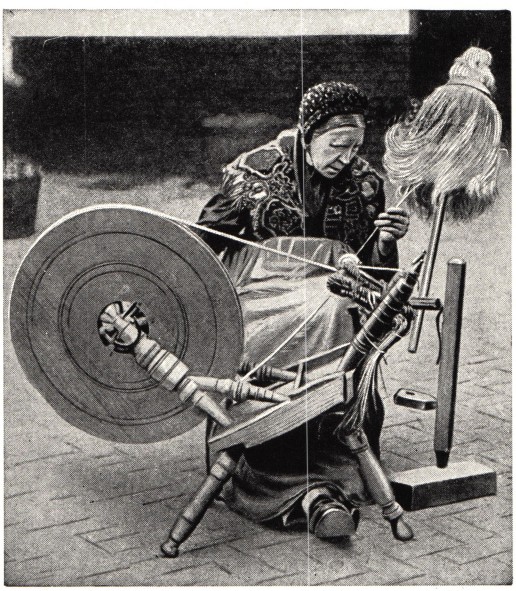
Spinning and weaving are two of the oldest industries of man, so that it is very surprising to find that until the eighteenth century the methods employed remained practically unchanged. When the machinery for the textile factories was invented, these two handicrafts began to die out in many countries, but in certain parts of the world where, for various reasons, factories have not appeared, spinning and weaving are still done by hand. Peoples of many races and living in every quarter of the globe are to-day still using spindles and distaffs and primitive looms very much the same as those employed by their forefathers many centuries ago, and the textile implements of one race differ in principle very little from those used by another.

HAVE you ever wondered—perhaps when you are holding a skein of wool on your hands while someone winds it into a ball—how it is that from the comparatively short hairs that make up the fleece of a sheep one thread yards and yards in length can be obtained? That is what spinning does. Spinning is the twisting together of a series of short threads and the drawing of them out to make one long, continuous thread. All silk does not need to be spun, because the thread provided by each silkworm is hundreds of yards long in its raw state, but wool, cotton, flax—all the other fibres from which man makes his cloth—must undergo the operation called spinning.

It is impossible to say when and where spinning first began, for it goes back to prehistoric days. We know this because spun thread or spinning implements have been found, together with certain remains of prehistoric man.

The oldest known form of spinning is with distaff and spindle. Monuments of ancient Egypt, old Greek mythology and countless fables, writings and ballads, all bear testimony to their use. Yet, old as it is, the same method is practiced in many parts of the world to-day.

The distaff, sometimes called the rock, is in its simplest form a cleft stick about three feet long, on which the raw wool or flax is wound; the spindle is a pin a few inches long, having a nick at the small or upper end of it, to hold the thread, and having a weight of some sort at the other end to make it hang and spin properly.



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SPINNING IN THE GOOD OLD WAY

This old Belgian woman spins as her great-great-grandmother did. With her right hand she turns the wheel, with her left she twists the thread that the spindle draws from the distaff.

The spindle is threaded with a long piece of the twisted yarn and is then set twirling rapidly. While it revolves, the spinner draws out the fibres from the distaff that she holds under her left arm, and twists them together. As she twists and the hanging spindle spins, the fibres are wound round each other and drawn out—in other words, the yarn is spun. When so long a thread is

ESTHONIAN LEGATION

WOMEN OF OESEL ISLAND in the Baltic spend many an odd hour spinning the wool with which to make the warm clothing necessary to meet the severe winters on the Gulf of Riga. They are also skilled at embroidery. Like most Esthonians, they are an energetic people, as they need to be in order to maintain themselves on a small bleak island.

REID

THE SHETLAND HOUSEWIFE cards and spins the soft wool that she will later knit into warm garments. Carding consists in separating the fibres of bundles of wool, such as this woman has on her lap, and preparing them for spinning into thread. In the Shetlands every process in the making of the world-famed woolen shawls is done by hand.

spun that the spindle nearly touches the ground, the spinner winds it around the spindle and starts again.

It is not known when the first spinning-wheel came into existence, but it was a great improvement on the distaff and spindle. Nuremberg and Brunswick, in Germany, both claim the invention, and there is a fourteenth-century manuscript in the British Museum that tells us of spinning-wheels. The early English monarchs, like the Eastern potentates of still earlier times, set great store on the art of spinning. For example, King Edward the Elder commanded his daughters to be taught the use of the distaff, and his father, Alfred the Great, referred in his will to the female portion of his family as the "spindle side."

The idea that exists in Germany, Rumania and elsewhere, that a bride should provide the household linen, shows that formerly no woman was considered fit for wifehood until she had spun and woven for herself a complete set of bed, body and table linen. Hence an unmarried woman was, and still remains in law a spinster or spinner, though the custom of women weaving and spinning their own clothes has largely died out.

After the spinning comes the weaving—that is, the combining of single threads to make cloth. This is done by stretching a series of threads—called the warp—tightly over a frame, and crossing them with other threads—the weft or woof—which are passed over and under the warp. The frame on which this is done is a loom. The illustrations show us many different forms of primitive loom, all of which, however, follow the same principle. The first looms were very simple; but improvements were gradually made to them. An important one was the invention of the device called the heddle, which raises and lowers alternate threads of the warp to facilitate the movement of the weft. The weft was first wound into a ball, then

© Cutler

IRISH RELIC OF A DAY WHEN ALL SPINNING WAS DONE AT HOME

Spinning was once an important home industry in Ireland, but it is now rapidly dying out. It is very strange that methods of spinning, which is one of man's very oldest industries, remained practically unaltered for centuries; and yet, in the last 150 years, since the first power machine was invented, no industry has made more rapid progress.

© E. N. A.

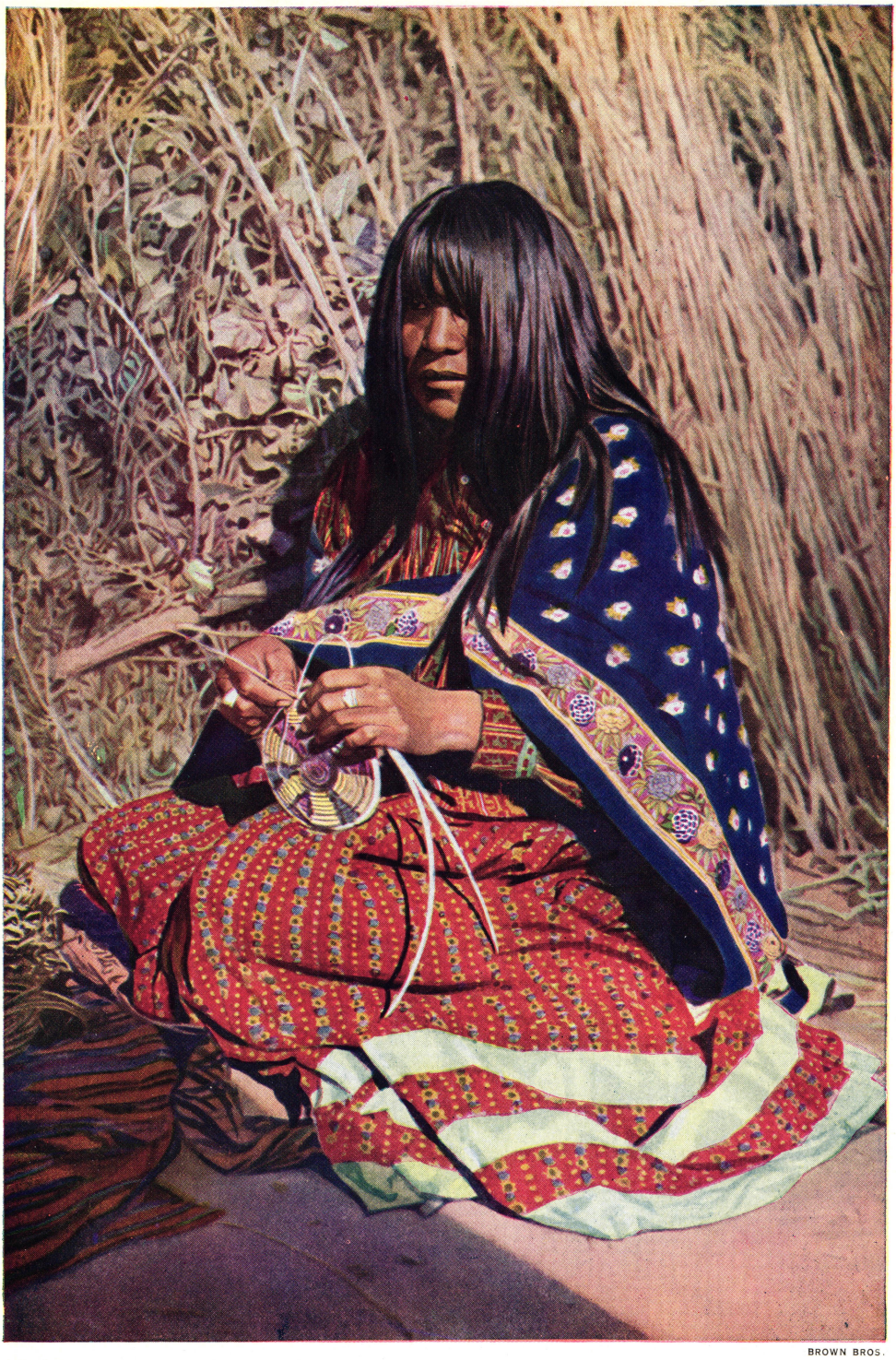
DISTAFF AND TWIRLING SPINDLE IN THE HANDS OF AN OLD BRETON

This is how all spinning was done before the spinning-wheel was invented. The spinner attaches the thread to the spindle, which she twists and then lets hang. It continues to twirl for a little time, and so, while the fibre is being drawn from the distaff by the weight of the spindle, the short fibres that compose the thread are being twisted together.

wound round a stick, then finally twisted round a spool which was enclosed in a torpedo-shaped shuttle.

So slowly, however, did man invent improvements in the methods of spinning and weaving, that as late as the middle of the eighteenth century the spinning-wheels and looms of our ancestors were little different from those of their forefathers. Then in the eighteenth, nineteenth and twentieth centuries improvements came so fast that the industry was revolutionized.

We can understand the change if we first watch a spinning-wheel and a hand loom, and then visit a modern textile fac-



BROWN BROS.

PUEBLO INDIANS, the agricultural town-building tribes named from the Spanish word for village, live in communal houses and do basket-work, weaving and pottery. Their baskets are colored with dyes that the Indians make themselves. The one upon which the woman above is working will be small, but for the harvests the Zuñis make larger baskets.

AMERICAN MUSEUM OF NATURAL HISTORY

NAVAHO WOMEN of the sage-brush desert of Arizona and New Mexico patiently weave, on looms which they construct themselves, soft blankets of really artistic design and coloring. These they sell to traders and to visitors to the reservations on which they live. Most of the Navahos (Navajos), who are of Athabaskan stock, breed horses, goats and sheep.

Andrade

SPINNING OCCUPIES THE HANDS OF THE ECUADORIAN SWINEHERD

It is strange that in an industry so widespread as spinning, practically the same methods of doing it should be employed everywhere. The native of Ecuador, like the Breton woman on page 357, and the Rumanian shown elsewhere, holds a distaff and twirls a spindle, though the one is only a stick and the other a cane stuck through a potato.

© Cutler

HOME WEAVER IN THE HUNGARIAN VILLAGE OF MEZOKOVESD

There is a greater difference between the looms used in the various corners of the world than there is between the spinning implements. This woman is a Hungarian, and upon her curious and rather complicated wooden loom she is weaving cloth from which to make a pair of trousers for her husband. Almost every cottage in Hungary has its loom.

UPRIGHT LOOM UPON WHICH A CHILEAN WEAVER MAKES HER CLOTH

In the southern and western parts of South America are found herds of wild guanacos and vicunas and of domesticated llamas and alpacas—beasts of the camel family—the long, woolly coats of which have proved very useful to man. This venerable Araucanian Indian of Chile is making a blanket of guanaco wool upon her simple loom.

tory and watch the marvelously intricate machinery that spins the short fibres of wool, cotton, silk or flax into long, continuous threads. Other wonderful machines shoot the shuttle holding the weft thread backward and forward between the threads of the warp, making hundreds of yards of material in an incredibly short time.

But although machinery and the need for increased production have killed many old handicrafts, the value of hand-loom weaving, whether as a pleasant home occupation or as an educational pursuit, will always exist. Fabrics turned out by a skilled and conscientious hand-weaver will invariably long outlast the cheaper cloths of modern machine production.

The "homespuns" of Scotland, Ireland and Wales that we see in shop windows are sometimes real homespuns made in the districts that give them their names. But often they are factory-made imitations, for manufacturers have been swift to turn out cloth imitating in appearance the old-fashioned cloth that would last for years. However good the machine-made "homespuns" may be, they can never surpass the fabrics woven so carefully and conscientiously upon the hand looms from threads spun on the old spinning-wheels, now almost curios for museums.

© E. N. A.

CHILDREN WHO MAKE SOME OF THE WORLD'S FINEST CARPETS: LITTLE ARMENIANS IN KURDISTAN

Turkish carpets have long been renowned for their beauty of design and their long-wearing qualities, but it is not usually realized that most of them are not Turkish but Armenian. Many are made by Armenian girls who if they were English would still be at school. The looms they use are very simple—upright wooden frames around which the warp threads are drawn taut. Weft threads of various colors are twisted round pegs stuck in the top bar of the loom, and enlarged details of the pattern are pinned up near the weavers.

Balkan News Agency

DISTAFF AND LOOM ARE NEVER LONG IDLE IN BULGARIA

The peasant women in Bulgaria are very industrious and never let their hands be idle. There is always flax or wool to be spun and cloth to be woven, for not only do they make all the material for their clothes, but they also make homespun for export. Here, at Dobromiri, women and girls have gathered together for a general spinning and weaving bee.

In many oriental lands hand-spinning and hand-weaving have not been superseded by machinery and are not likely to be. The hand-made carpets and rugs of the East are in great demand all over the world, not only because of their beauty of design, but because the care with which they are made and the beautiful colorings produced by the use of vegetable dyes, mean that these wares will outlast many a machine-made article, in the coloring of which mineral dyes have been used. In museums we may see examples of Persian and Turkish rugs and carpets two or three hundred years old, as freshly colored and beautiful as when they were made.

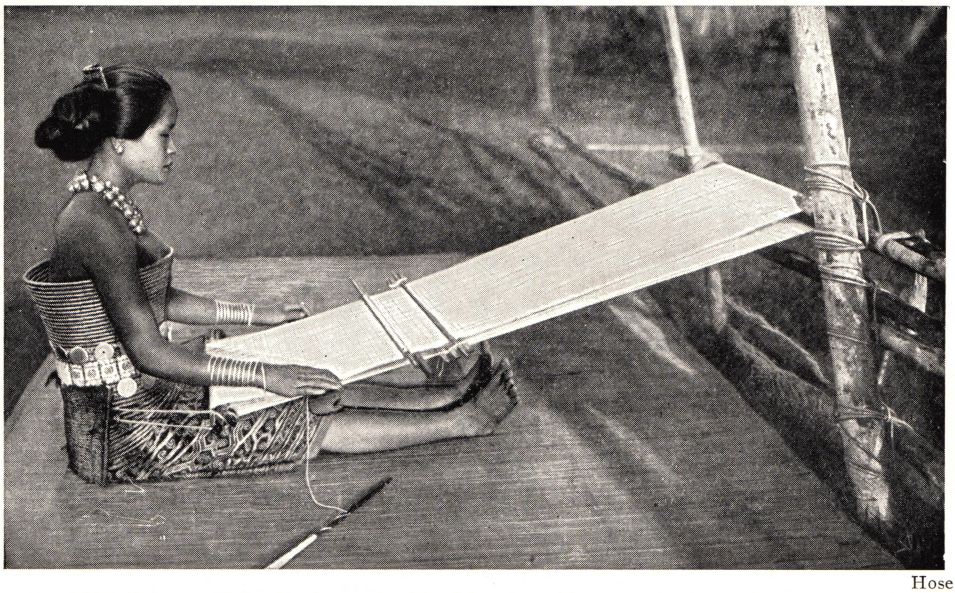
The looms of Europe and America supply China and India with an immense quantity of cheap cotton fabrics and woolens, but fortunately, the hand-loom plays an important part among the natives of those countries. Some of the most beautiful hand-made materials in the world come from China, and an old piece of Chinese tapestry will fetch a large price and Indian silks are prized for their quality and design. Yet the looms on which these lovely materials are made appear very crude and imperfect.

China and India are, however, the homes of old civilizations. Even the most primitive people have taught themselves

Prideaux

THE SPINNING-WHEEL AS IT IS STILL USED IN CHINA

Here we see how cotton is spun in a Chinese home. This woman's spinning-wheel is different in shape from those shown on other pages, yet it works on the same principle. She has, however, one great advantage over both the Belgian and the Irish woman. She turns the wheel with her feet—by means of a treadle—and so has both hands free.



Hose

HOW A QUEERLY DRESSED MAID OF BORNEO DOES HER WEAVING

The loom of this Iban woman of Borneo is very simple. The warp, or lengthways thread, is looped round a cross-bar and a small rod, and is kept taut by a piece of webbing around her waist. She runs the long shuttle that lies beside her in and out between the lengthwise threads of the warp and thus makes clothes for herself and her menfolk.

© E. N. A.

NEWAR WOMEN OF NEPAL WORK AT THEIR LOOM IN THE OPEN AIR

Of the two chief tribes in Nepal, the Ghurka are the fighting men and the Newars are the craftsmen. Newar men build elaborate wooden houses, and their women make cotton cloth on their home-made looms. The woman on the left is doing the weaving; the one on the right holds a large brush with which entangled threads are separated.

methods of spinning and weaving. In uncivilized lands, far from places where cheap fabrics and machine-made clothes can be procured, the women of the savage races, and even the men, spin animal or vegetable fibres with primitive distaff and spindle and erect curiously ingenious looms, on which they weave material to make what clothing they require.

The Indians of North America were not so skillful at spinning and weaving as some other primitive peoples though Alaskan Indians wove blankets of goat's hair, and some of the Plains Indians made rough cloth of buffalo hair. The work of the Pueblo Indians as shown in the colored plate was the best.

Spinning and weaving, two of the oldest industries of mankind, have been practiced for centuries in similar ways by Christian and heathen, by black man and white, by civilized man and savage.

McCann

THE WEST AFRICAN NEGRO MAKES LONG STRIPS OF NARROW CLOTH AT HIS INGENIOUS LOOM

In most parts of the world weaving is regarded as woman's work, but on the Gold Coast man takes it in hand. His loom is certainly ingenious, and, for all its apparent simplicity, somewhat complicated. The warp threads are kept taut by large weights, and the heddle, the contrivance that raises alternate threads of the warp to simplify the movement of the shuttle, is worked by cords around the weaver's toes. His supply of yarn is ready to hand on a very ingenious machine, extraordinarily like one used by us for winding skeins of silk or wool.

Lewis

INDUSTRY AND IDLENESS IN A FAR EASTERN ISLAND

Like the Hungarian woman and the West African boy pictured on other pages, this girl of the Celebes works at her loom before the door of her house. Here, however, the similarity ends, for looms, houses and weavers are all of very different type. Her loom is more like that shown on page 364, which is worked by a girl of the neighboring island of Borneo.

WILD ELEPHANTS THAT IN A FEW MONTHS' TIME WILL BE OBEYING THEIR NEW MASTER, MAN

Wild elephants are usually caught by one of three methods. Sometimes a deep pit, nearly filled with brushwood, is dug in their path. Sometimes trained female elephants are sent out as decoys, to attract the wild bulls, whose legs are caught with nooses before they realize man's presence and firmly bound together with ropes. The third method is to drive a whole herd, by drum, trumpet and human voice, into a prepared enclosure. These elephants of Perak, in Malaya, have been trapped by the latter method, and are not unnaturally rebellious at their loss of freedom.

MY LORD THE ELEPHANT

His Marvelous Strength in Work or Play

The elephant is the largest of all mammals except the whale, and for centuries the enormous strength of the Asiatic variety has been used by man in peace and war. Despite its size the elephant is a timid animal, and it is ludicrous to see one of these great beasts frightened by the yappings of a terrier, which it could send flying through the air with a flip of its trunk. In India, Burma and Siam the elephant can be seen to-day, as in the past, in gorgeous trappings, taking a prominent part in processions or busy at tasks suited to its strength and trained intelligence. African elephants, which are larger and less tractable, are seldom taught to work: they are hunted for the sake of the valuable ivory of their great tusks, which are sometimes over ten feet long.

MY Lord the Elephant is the name given to those huge animals that are so characteristic of India. As the elephant strides proudly down the street, no one ventures to dispute his right of way. He towers above bullock-carts, carriages and camels.

With stately steps he solemnly advances, moving his great head from side to side. Only to his mahout, or driver, does he yield obedience—though the mahout himself looks insignificant as compared with the mighty creature whose course he directs.

India would lose half her romance if she lost her elephants. All the great princes and many of the lesser personages have as many elephants as they can afford—the largest and finest their wealth can purchase. Indian princes love display and elephants seem to have been especially created for pageants.

When a maharaja rides forth on some great occasion, his finest elephant is decorated from head to foot, his state howdah is of silver or gold, and beneath it is a splendid howdah-cloth of red velvet, embroidered with gold thread. This covers the elephant's back and hangs down on each side to within a foot or two of the ground. Anklets of gold, silver or ivory encircle the animal's feet; its trunk is painted and its forehead covered with jewels.

The great prince himself is dressed in the finest silks: his neck is encircled with gems and his turban flashes with diamonds. But in a motor car that prince would scarcely attract attention; it is the elephant that makes him so magnificent. And as the great beast moves forward, with its curious up-and-down swaying gait and swinging trunk, it appears to appreciate the dignity of its position.

Some elephants are devoted to the service of the gods. Most of the temples of south India have their own sacred elephants that live within the temple courts, take part in the religious processions and receive gifts.

In some temples the elephants have the symbol of the god painted in white and red upon their trunks and foreheads. In the vast temple at Madura the sacred elephants are taught to beg from visitors. In one hall of great, carved pillars dwell two of these monsters in charge of a keeper. They kneel before each visitor and salute with their trunks. "Master, the elephants salaam to you," says their keeper. "They ask you to give them money, master." If the almsgiver drops a coin too small before them, they trumpet their disapproval and wave their trunks over his head in a threatening manner. One must donate coins sufficiently large for them to pick up with the finger-like tips of their trunks.

In the mountain town of Kandy, in Ceylon, there is a shrine known as the Temple of the Tooth, because the chief object of devotion is a relic said to be the tooth of Buddha. Once every year, at the Perahera festival, the golden casket containing the precious relic is borne through the town in a procession of elephants. It is carried in a gilt howdah on the back of a magnificent temple elephant,

Fry

ON THE SECOND DAY OF AN ELEPHANT HUNT: THE SPORT OF KINGS IN THE EASTERN LAND OF SIAM

When it had been decided that more elephants were needed for the king's stables, a wild herd was rounded up by men on trained elephants, while king and court looked on. Fortunately the herds are composed only of females and young bulls. At Ayuthia, about forty miles north of Bangkok, is a keddah, an enclosure surrounded by stout palisades, and into this the wild beasts are driven. Men on trained elephants enter the keddah, make fast the pick of the herd with nooses of rope thrown about each of their feet and proceed to tame them by offering them rice-balls.

STRENGTH OF THE ELEPHANT PUT TO HUMBLE USES IN SIAM

Although in Siam all wild elephants belong to the king and the rare white or albino ones are creatures accorded high rank, many trained elephants, usually small ones, are put to menial work. One sees them shoving heavy objects about with their heads, hauling wagons and generally serving in ways in which cart-horses do in other countries.

literally covered with decorations, and is shaded by a canopy supported on long poles carried by four attendants who walk beside the elephant. Two other fine elephants walk with the chief one, and many others follow behind, bearing the yellow-robed monks and the Kandyan chiefs.

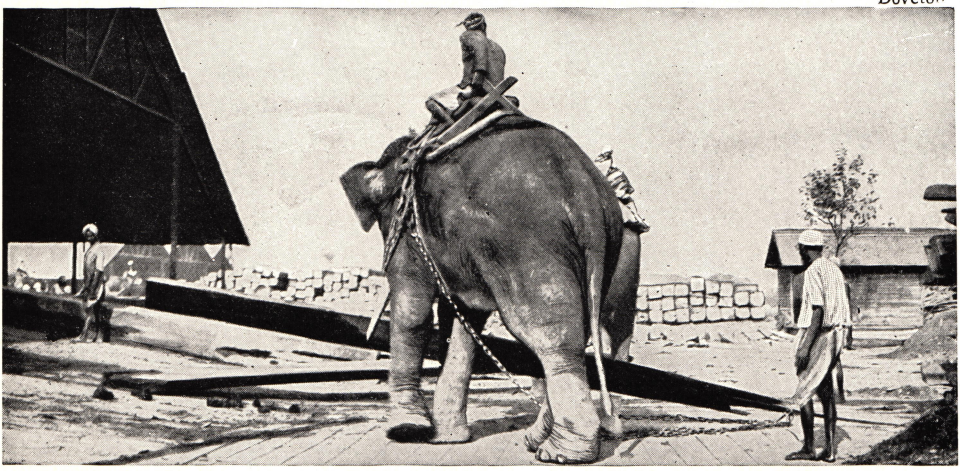
White elephants, which are found in Burma and Siam, are of the same species as the ordinary Indian elephant, but are a pinkish-white in color. They are treated with reverence in Siam and Burma.

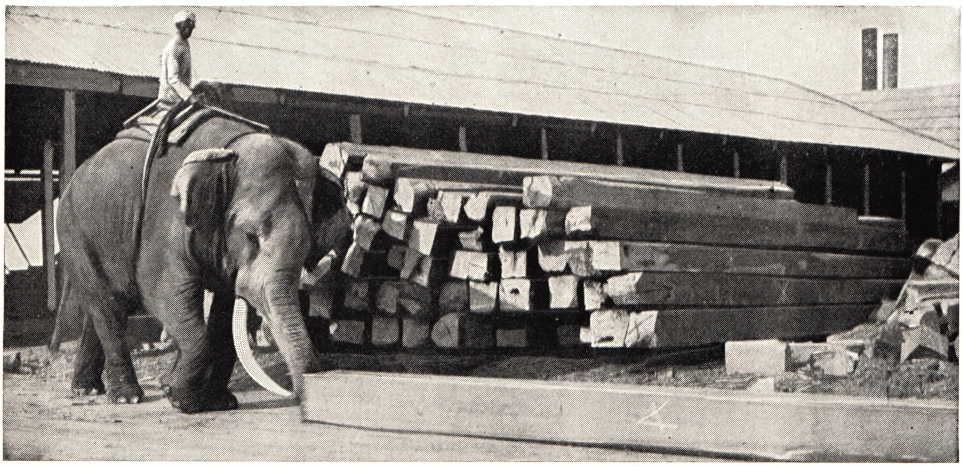
In past ages elephants have been used as a fighting force in battle. More than two thousand years ago great Indian kings kept their companies of war elephants. When Alexander the Great invaded India, three centuries before Christ, he crossed the Indus into the Punjab and on to Hydaspes (Jhelum) to find that the army of King Porus was strengthened with groups of elephants, placed at intervals along the battle-front, towering aloft like turrets above a city wall. The king himself fought and directed his army from the back of one of the great beasts.

These elephants nearly spoiled Alexander's plans for, maddened by wounds, they broke through his ranks. But the mahouts lost control of the terrified animals; the Greeks re-formed and swept forward to victory.

The heavy wooden doors of old Indian castles are usually studded with huge iron spikes, pointing outward, only a few inches apart. They have been put there to resist an elephant charge. In days gone by war elephants were trained to attack the gates of a fortress with their heads. Such a charge, with the weight of the elephant's body behind it, would be like a battering-ram. Elephants are easily alarmed and then get out of control. In Hyderabad, for example, it has been found that motor cars terrify the elephants that hitherto have dominated the streets. It is told, however, that once an India elephant was feeding on the herbage of a valley near one of India's more remote railway lines when it perceived its first railway train. The snorting black monster came rushing toward it, the en-

Doveton

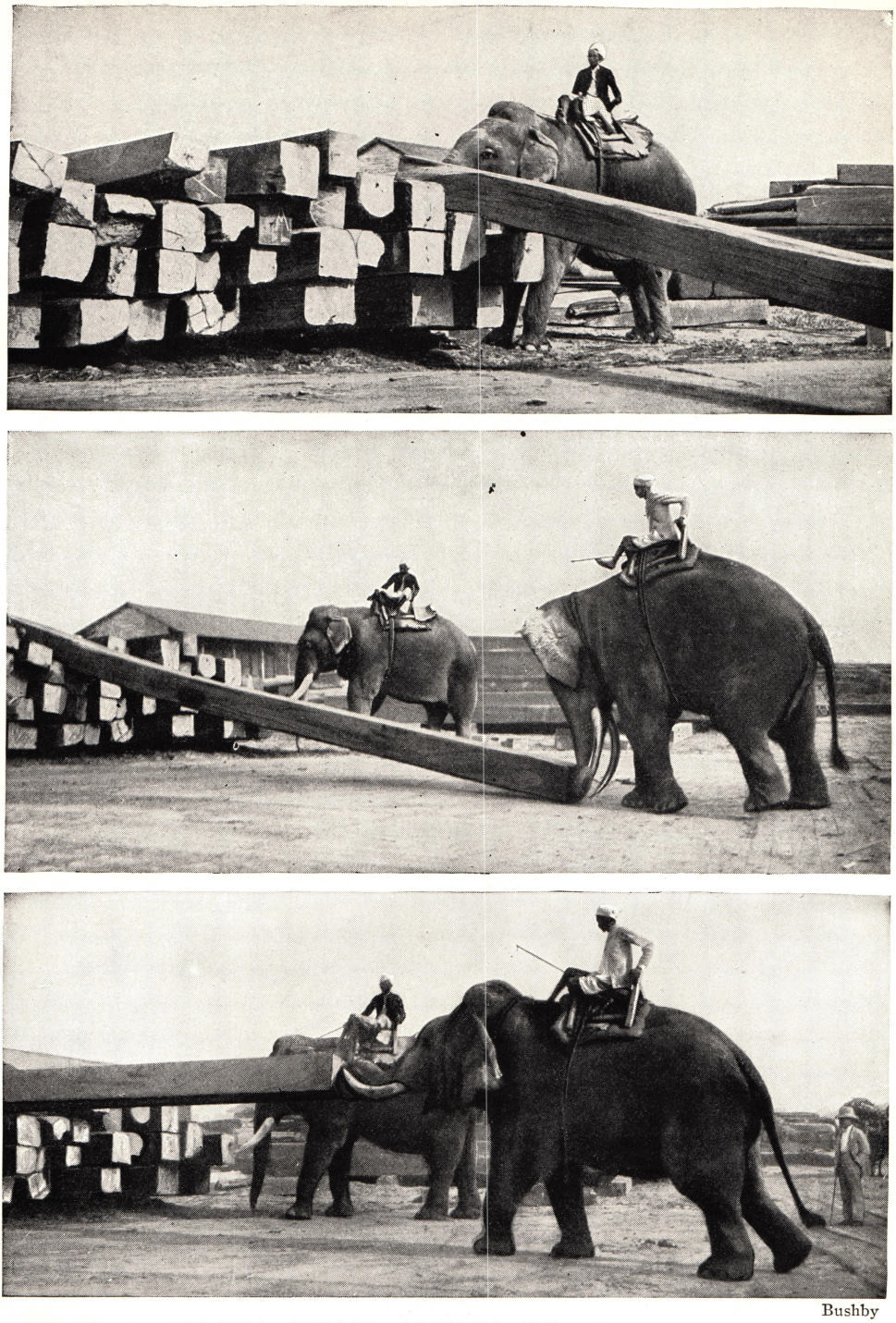




Bushby

ELEPHANT WORKERS IN THE BURMESE TEAK FORESTS

One can best understand the trained intelligence of the elephant by watching him at work in the Burmese teak forests. He pulls rough logs to or from the river down which they are floated, and can carry a sawn plank across his tusks, keeping it steady with his trunk, or with that same organ push the heavy balks along the ground.



Bushby

THE ELEPHANT IS A SKILLED ARTISAN AND NEEDS NO DIRECTIONS

When he has shoved a balk to the right spot, he lifts one end on to the stack and works it in line with those already in place. Then, moving to the other end, he uses his coiled trunk to push the balk home. Small wonder that this clever animal has been indispensable to the forestry industry of Burma and India for many centuries.

Assam-Bengal Rly.

DENIZENS OF THE WILD THAT MAN HAS TRAINED TO HIS OWN ENDS

In Assam, a mountainous province of eastern India, there are great herds of wild elephants, and every year numbers are caught and tamed. They can be taught to lift logs in their jaws and drag them where needed or to carry howdahs. For ivory the African elephants are more prized, for their tusks are larger.

gineer's whistle sounding what must have been a challenge to the pachyderm. This infuriated the great beast: nothing he had ever met had been his superior in brute strength; he determined to meet the train head-on and put it to a tug-of-war. On came the creature of the gleaming iron rails; on came the elephant, snorting his wrath. The engineer applied the emergency brakes; the elephant did not. Of course his thick skull didn't last one second against the drive of the engine. The locomotive was derailed—but the elephant was done for. Buffalo are said to have behaved the same way in America.

Since early times monarchs have used elephants for sport. In the Roman amphitheatres elephants engaged in mortal combat with one another to amuse the crowds of the Imperial City. The Gaekwar of Baroda, one of the most powerful of Indian princes, still has elephant fights in an arena in his palace grounds.

The huge gladiators fight with blunted tusks, so as not to do one another serious harm. With their mahouts to guide them, they engage in a giant tussle of strength, butting with their mighty heads and opposing strength to strength. Nowadays it is little more than a friendly contest for a decidedly heavy-weight championship.

For the royal sport of tiger-hunting the Indian princes and their European guests usually ride on elephants trained for the purpose. The hunters sit in specially constructed howdahs that enable them to fire in every direction.

Left to itself, an elephant will seldom face a tiger; but guided by its mahout and protected by the rifles of the hunters on its back, it enters into the chase with loud trumpetings. It is remarkable how, by

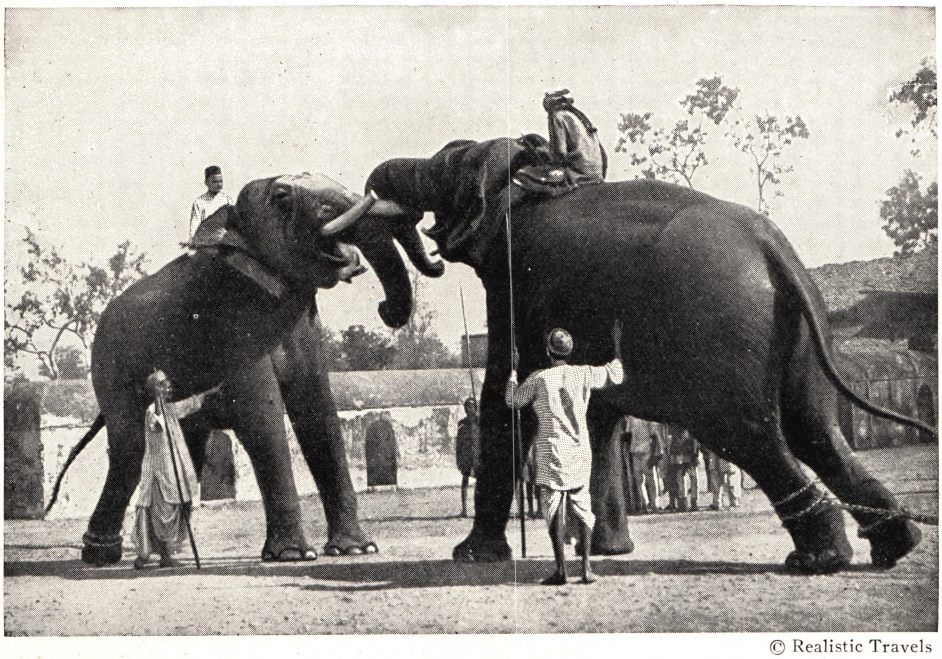
training, the elephant's natural timidity in the presence of its enemy, the tiger, may be overcome.

Many elephants have to work hard for their daily rice-ball and cut grass. In one of the great teak forests where the lumbermen are at work watch an elephant as he draws a huge log to the river. It is obviously child's play to him. Notice, however, that he does not carry the logs, he pulls them with the aid of a rope fastened around his body. In the timber yards at Rangoon the trained elephants stack the timber. They lift the heavy balks of teak, carry them across the yard and stack them in piles—carefully putting them straight.

Strange tales are told of these timber-yard elephants and their intelligence. It is said that one evening, as a driver was about to finish removing a number of logs, the bell rang for work to cease. There was only one more log to move, and the man thought he might as well finish the job. His elephant, however, struggled in vain with that last log, and the driver called to his aid another elephant that was passing on its way to the stables.

The two of them failed, and a third elephant was summoned. Finding the task so unexpectedly difficult, the driver now resolved to leave it until the morrow. Next morning the first elephant got his tusks under the log and easily carried it away without assistance. He had known that when the bell rang it was time to stop work.

Elephants do not lift heavy weights with the trunk, a far too delicate and precious an instrument to risk in that way. The elephant may put his trunk around a man and lift him, or he may use it to break off the slender branches of a tree. He may turn his trunk into a step-ladder to enable his mahout to climb up to his neck. But he will not lift a balk of timber with it. He will carry logs on his tusks, or even in his mouth, but not with his trunk. Indeed, the trunk is



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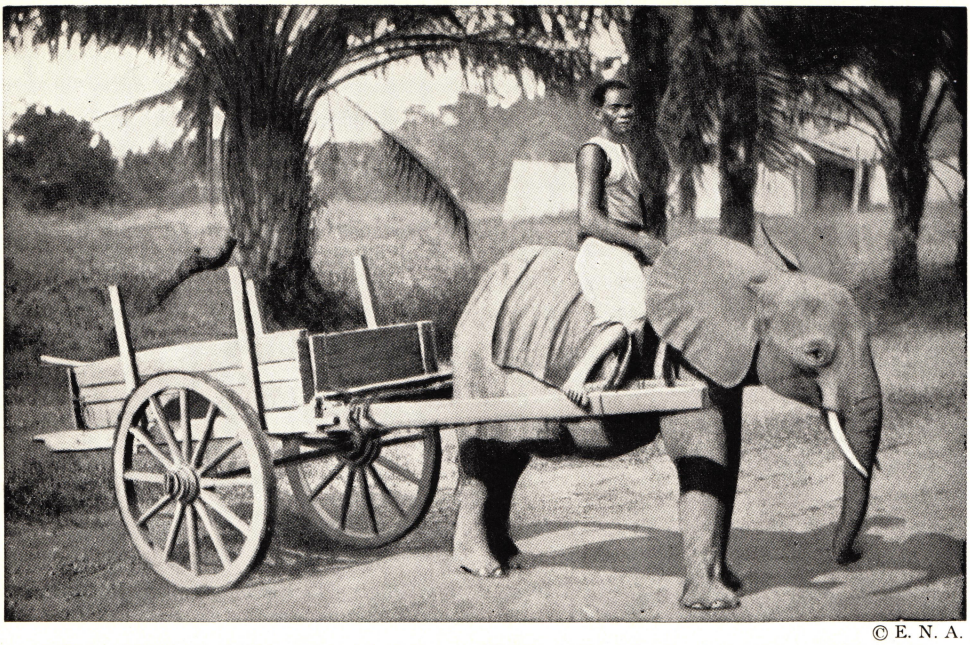
A WRESTLING MATCH ARRANGED FOR THE SPORT OF KINGS

Though a bull elephant occasionally turns rogue and becomes dangerously vicious, the great beasts are usually good natured. However, in the palace grounds of the Gaekwar of Baroda, contests between two giant tuskers are sometimes arranged. Their tusks are blunted, their hind legs are chained, and it becomes largely a butting match.



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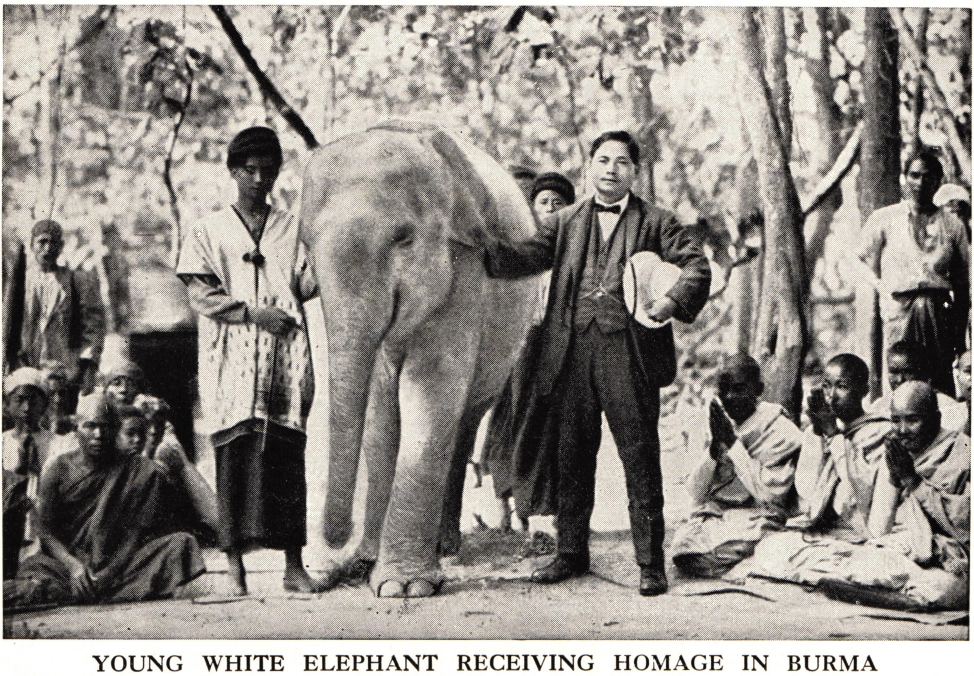
THIS CONGO BOY HAS MADE A SERVANT OF A PIGMY ELEPHANT

The pigmy elephant that lives in the Congo, when full grown, will be no larger than a cart-horse. In miniature it resembles other African elephants. It is interesting to note that fossil pigmy elephants have been found in the limestone caves of Cypress and Malta, and that dwarf elephants are found in the same places as pigmy hippopotami.



YOUNG WHITE ELEPHANT RECEIVING HOMAGE IN BURMA

A white elephant is regarded with unusual respect in Burma and is revered in Siam. It must be treated with such pomp in the latter country that the king when angry with one of his nobles gives him a white elephant, knowing the proper care of the gift will ruin him. Occasionally an American circus displays one of these pale-hued monsters.

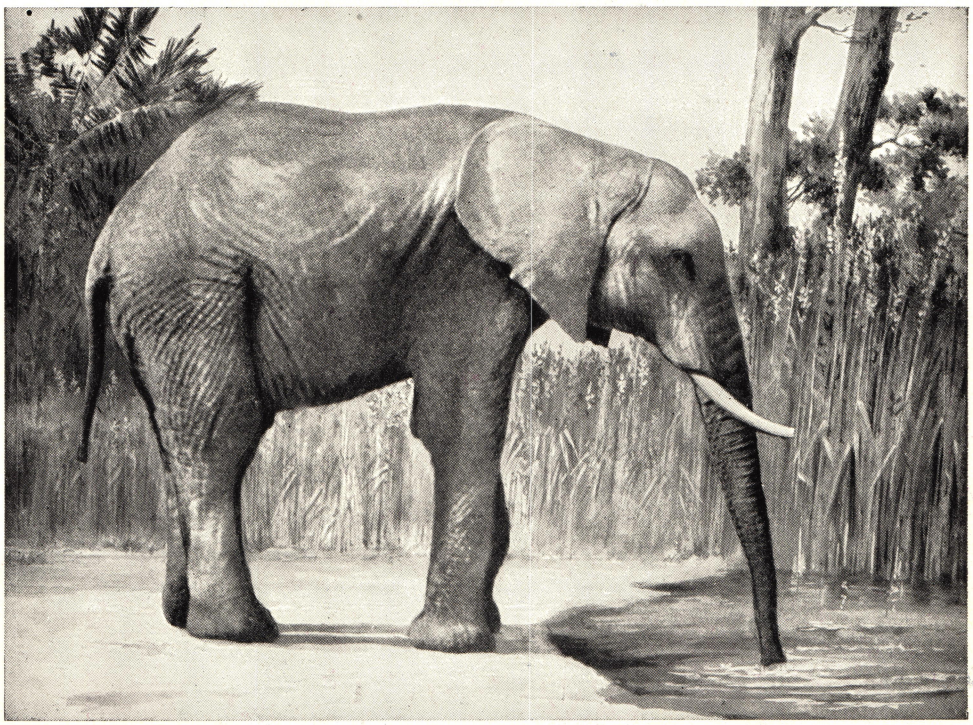
so delicate that an elephant can pick up a coin with the finger-like muscle at its tip. He can also knot the end of it to deliver a blow, though his kick is even more effective. He uses his trunk for conveying food and water to his mouth and for squirting water or dust over his body.

The tusks of a full-grown male elephant are frequently five or six feet long, and rare specimens have measured eight or ten. To the elephant, tusks are useful not alone for lifting objects but as weapons. African elephants use them as instruments for even digging up edible roots.

In Africa, elephants are killed for their ivory, and are seldom captured and trained. The sportsman, rifle in hand, hunts them on foot. Guided by African hunters, he creeps through the undergrowth of the forest toward some spot where a herd or a stray rogue is believed to be. The greatest care is necessary, for a mistake may cost the sportsman his life. The monster can crash through the undergrowth at vast speed, smashing the creepers before him like cotton threads. To be caught by that waving trunk, or on those gleaming tusks, is almost certain death.

The African elephant is larger than the Indian, being frequently ten or eleven feet high. It can charge at a greater speed and maintain it for a longer distance than its Asiatic cousins.

It is said that for three hundred yards or so it can run at a speed equal to fifteen miles an hour, and for a full hour can keep up a pace of ten miles, as against the Indian elephant's six or eight. As a rule, too, its tusks are larger and usually both males and females possess them. The great difference between African and Asiatic elephants, however, is that the African has much larger ears.

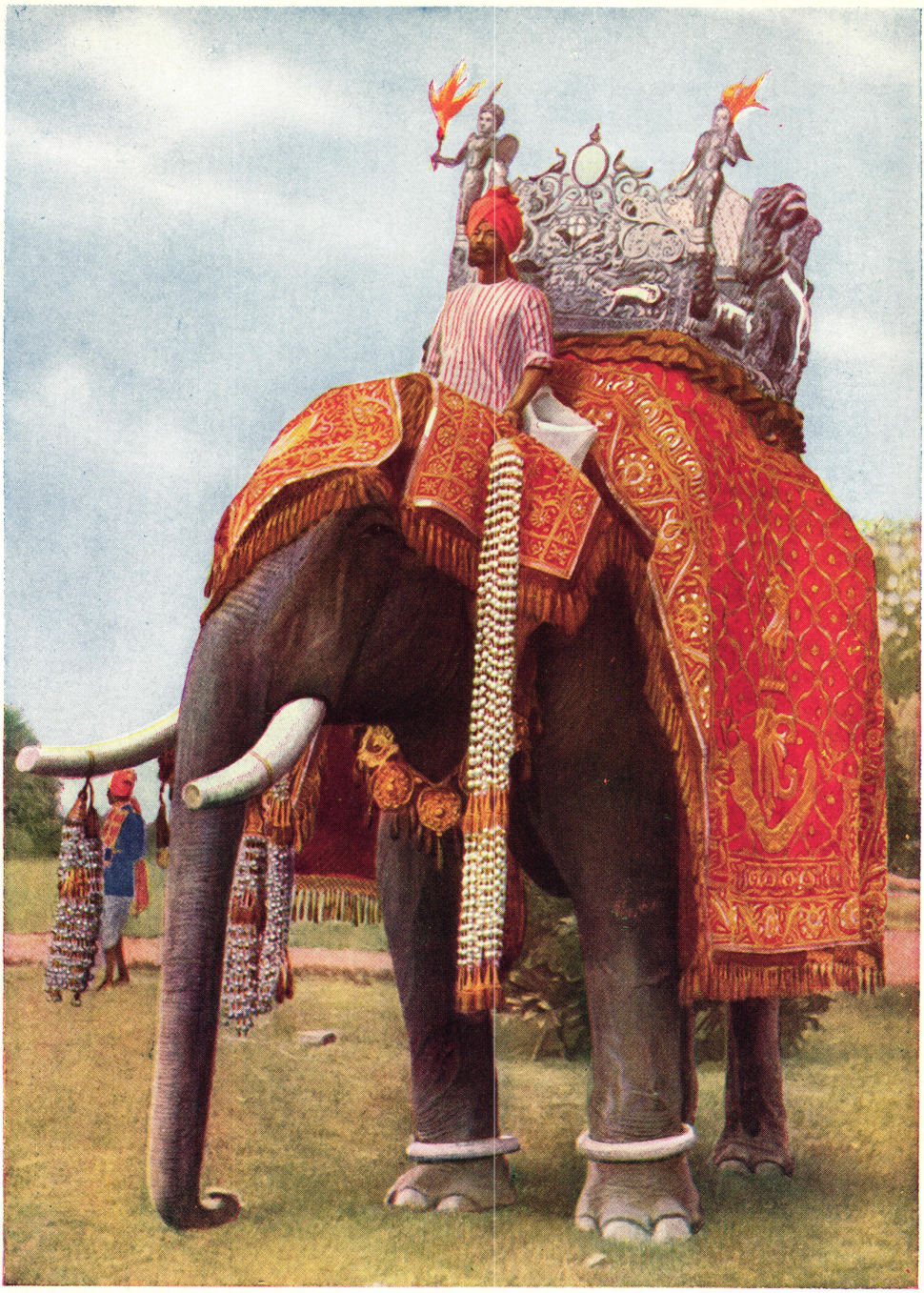


FROM THE AFRICAN ELEPHANT COMES MOST OF THE WORLD'S IVORY

The larger ears and more wrinkled trunk distinguish the African elephant from that of India. It is also more savage and instead of living on leaves, fruit and grass, it eats roots and boughs, digging the roots up with its tusks. Circus men have found it impossible to train their African pachyderms either to work or to perform.

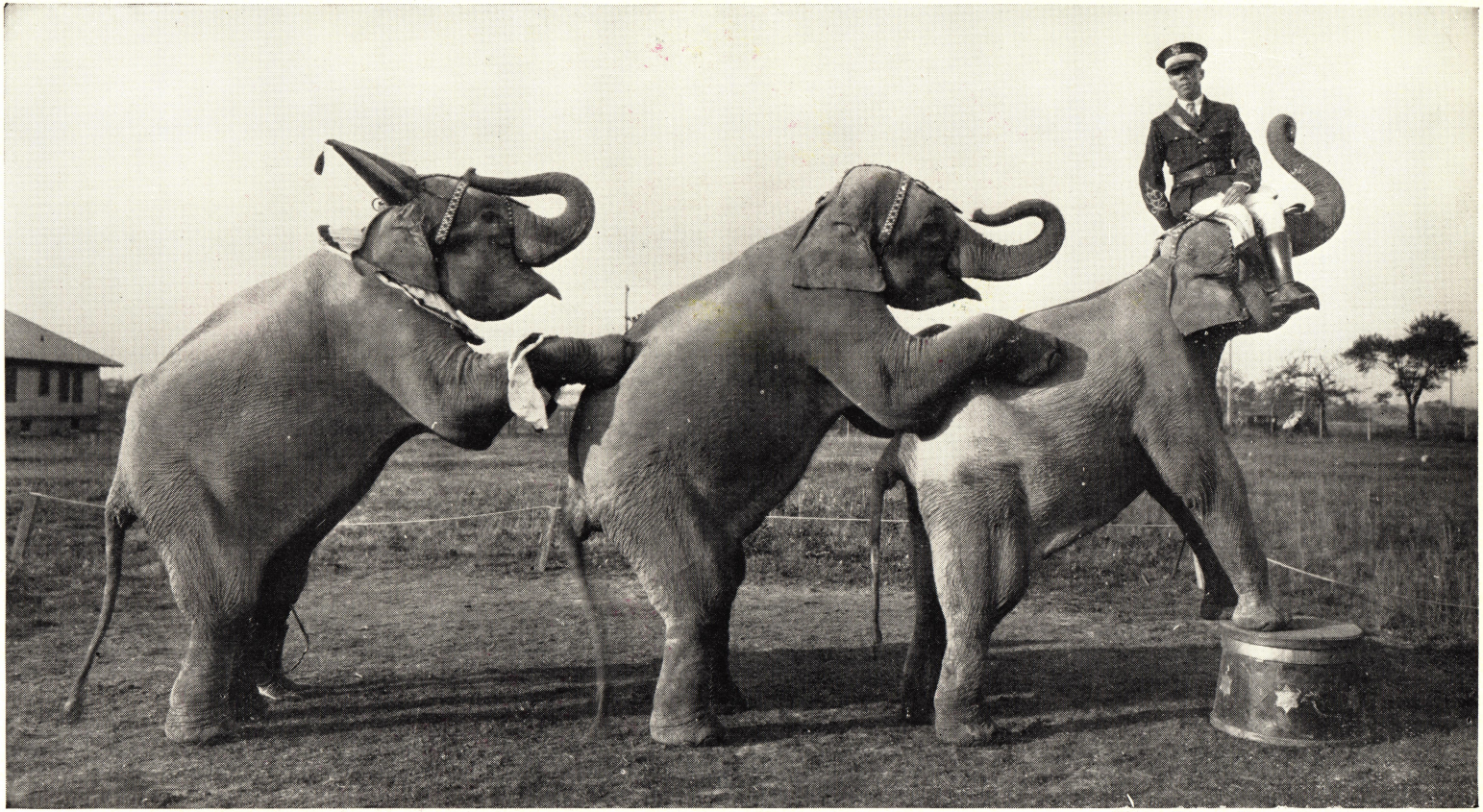
REALISTIC TRAVELS

A STATELY PROCESSION is formed by the Gaekwar's elephants with their gorgeous trappings as they pass through the principal bazaar of Baroda. The town, the population of which is nearly ninety-five thousand, is the capital of the important Maratha state of Baroda, one of the so-called native states which recognize the overlordship of the King-Emperor; but its ruler is a man of modern ideas and has introduced many Western inventions to his people, as may be seen by the telegraph poles and the arc lamps on the right side of the street.



BARBER

IN GORGEOUS TRAPPINGS of scarlet and gold, with tassels of pearls hanging over ears and from blunted tusks, a necklace of gold plates and anklets of ivory, and an ornate silver howdah on his back, this Bengali elephant is a mount fit for a king. Though the usual height of an Asiatic elephant is eight or nine feet at the shoulder, this one—a veritable giant among pachyderms—is nearly twelve. An elephant usually weighs from two to three tons, and, even in captivity, has been known to live for a hundred years.



Photo, Century Flashlight Photographers, Inc

CLEVER COMEDIANS OF THE AMERICAN CIRCUS: CHUNKY FELLOWS FOND OF CLOWNING

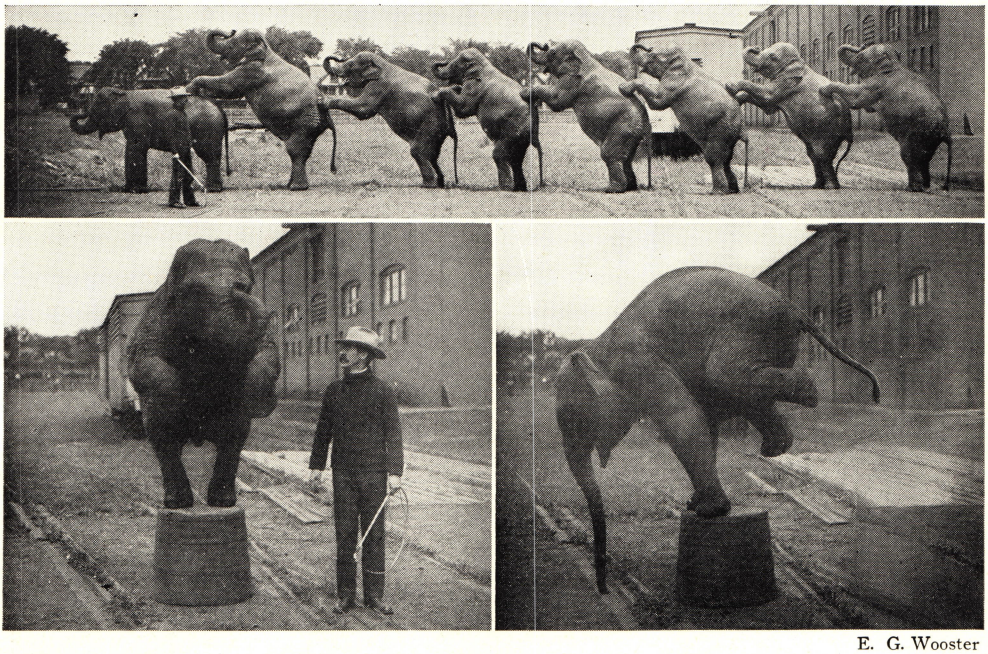
The American circus always has elephants and they receive the best of care. For one thing, if they were not given their breakfast on time, eight bales of hay for, say, a troupe of forty, it is possible that the pachyderms would kick their car to pieces and go foraging in the nearest field or vegetable garden. Their skulls are as hard as iron, and it is recorded of an elephant stampede that when a mere barn got in the way of their line of progress, they went right through its walls as if it had been pasteboard instead of wooden.

In certain regions of West Africa there lives a race of pigmy elephants, which, even when full grown, are not very much more than five feet in height. The ears of these little elephants are not so crinkled as those of the ordinary African elephant. As we can see from the illustration, they may be tamed and trained to draw carts. They are certainly cheaper to feed than their big brothers.

The intelligence of "My Lord the Elephant" is a matter of dispute. Most people imagine that so huge an animal must have a correspondingly huge brain. Indian idols accordingly represent the Hindu god of wisdom as having the head of a pachyderm. One must remember, however, that actually the animal's brain is small in proportion to its size. The powerful brutes are trained by the simple method of being awarded with extra food for performing what is required of them. Circus elephants that learn to stand on their hind legs are first shown the posture desired by being lifted into position.

Elephants are terrifically afraid of thunder and lightning. One of the times of supreme danger under the white tops of the circus is when the sounds of a storm break in on the rhythm of the steam calliope and the smell of electricity pierces the peanut-laden atmosphere of the sawdust ring. The gigantic gray beasts, but a moment before placidly posing on barrels, eating from plates and bottles ranged on a human table or pushing the red and gold tiger cage-wagons to their places in the arena, now have to be handled with diplomacy. But there have been cases on record where, despite the confidence-inspiring tones of their keepers, they make a bolt for the open—even though it takes them straight through guy ropes and orchestra seats, as far as they can go before the storm is over.

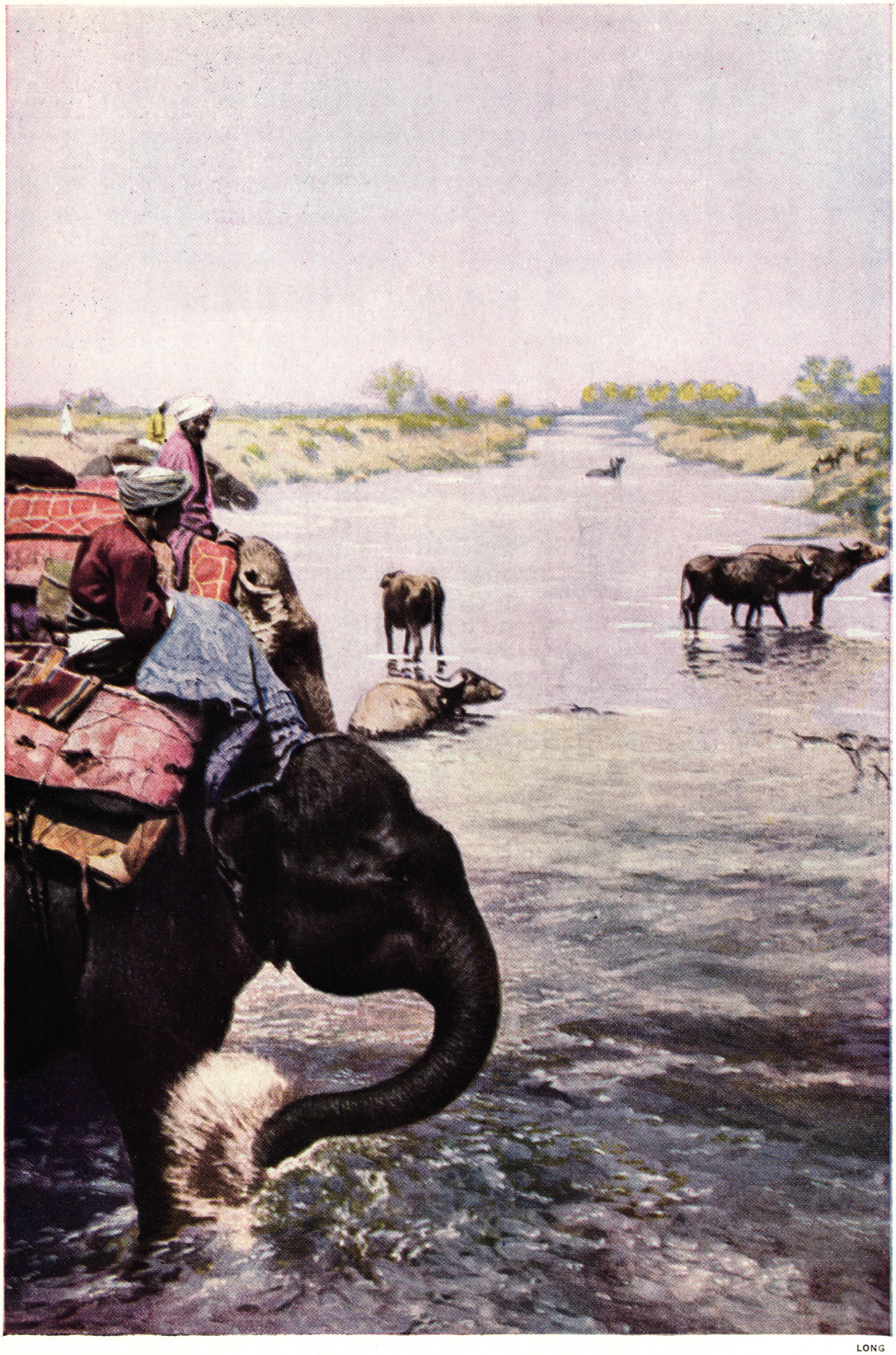
One of the greatest treats that can be given them is a chance to go swimming. The chunky fellows will squirt trunkfuls of water at one another and meet the oncoming waves with snorts of enjoyment.



E. G. Wooster

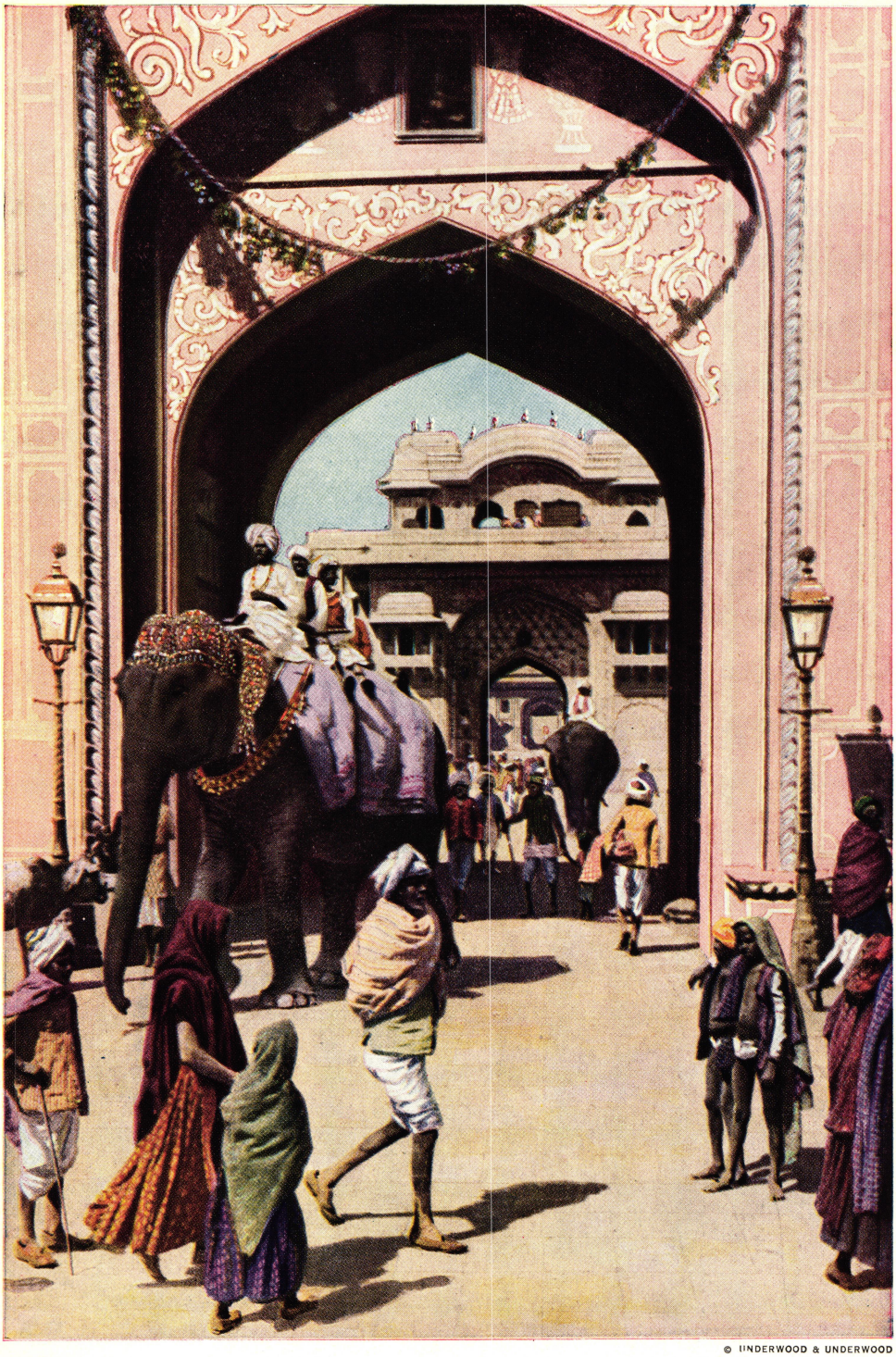
CIRCUS ELEPHANTS DEFYING THE LAW OF GRAVITY

This shows the winter training quarters of Ringling Brothers, Barnum and Bailey's Circus, which tours North America. Here about forty elephants of varying ages learn to march on their hind legs, dance on tubs, and give a semblance of eating at a table or playing in an orchestra. They also push the heavy wagons from the circus lots to the railway sidings.



LONG

ASIATIC ELEPHANTS, dwellers in the humid jungle forests, lovers of warmth and mud, are never so happy as when they are in the river. With their trunks they draw up the cool water and either squirt it down their throats or pour it over their parched skins. They will also hose down any man or beast that has annoyed them. Elephants are good swimmers.



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FROM THE ROYAL STABLES of the Maharaja of Jaipur come two of his elephants to take their daily exercise. Throughout India these dignified pachyderms are regarded as the proper mounts for royalty, though their stiff-legged gait is anything but comfortable to one accustomed to riding on horseback. The great beasts can, however, carry enormous weights.

© Ewing Galloway

ONE OF THE VENTS OF VESUVIUS' SUBTERRANEAN FURNACE

Vesuvius in 79 A.D. destroyed Pompeii, Stabiæ and Herculaneum in a torrent of mud. Quiescent then until 1631, it shot forth lava which flowed so rapidly that, it is said, eighteen thousand people lost their lives. Its recent activities have been recorded by vitaphone, so well is its conduct now understood. Its crater, unlike the fiery lake of Mauna Loa, is rocklike.

THE FIRE MOUNTAINS

How Volcanoes Act as the Earth's Safety Valves

Gases and steam, generated by the terrific heat in the interior of the earth, exert a tremendous pressure upon its surface. When this pressure becomes too great, a safety valve in the form of a volcano, allows the vapors to escape like the steam of a locomotive. Unfortunately if a city or a village is close to the mountain it may be overwhelmed by the streams of molten lava and the clouds of dust that accompany these eruptions. When Stromboli or Vesuvius send up their plumes of smoke by day, or the glow of their hidden fires which light the sky by night, one ponders whether the energy of these volcanoes might not somehow be turned to use by man, instead of being a continual menace to the safety of both lives and property in their neighborhood.

VOLCANOES are openings in the earth's crust out of which, from time to time, steam, tuff (ashes), molten rocks and lava, and sometimes mud are thrown. They are usually found in those parts of the world where mountains are still in process of being made, and where the rocks have undergone what is known as folding and fracture. We find most evidence of such volcanic rock along the ranges of the Pacific islands, where the mountains run near the borders of the ocean basins. The name was originally associated with Vulcan, the god of fire of Roman mythology. Geologists differ as to the source of the heat.

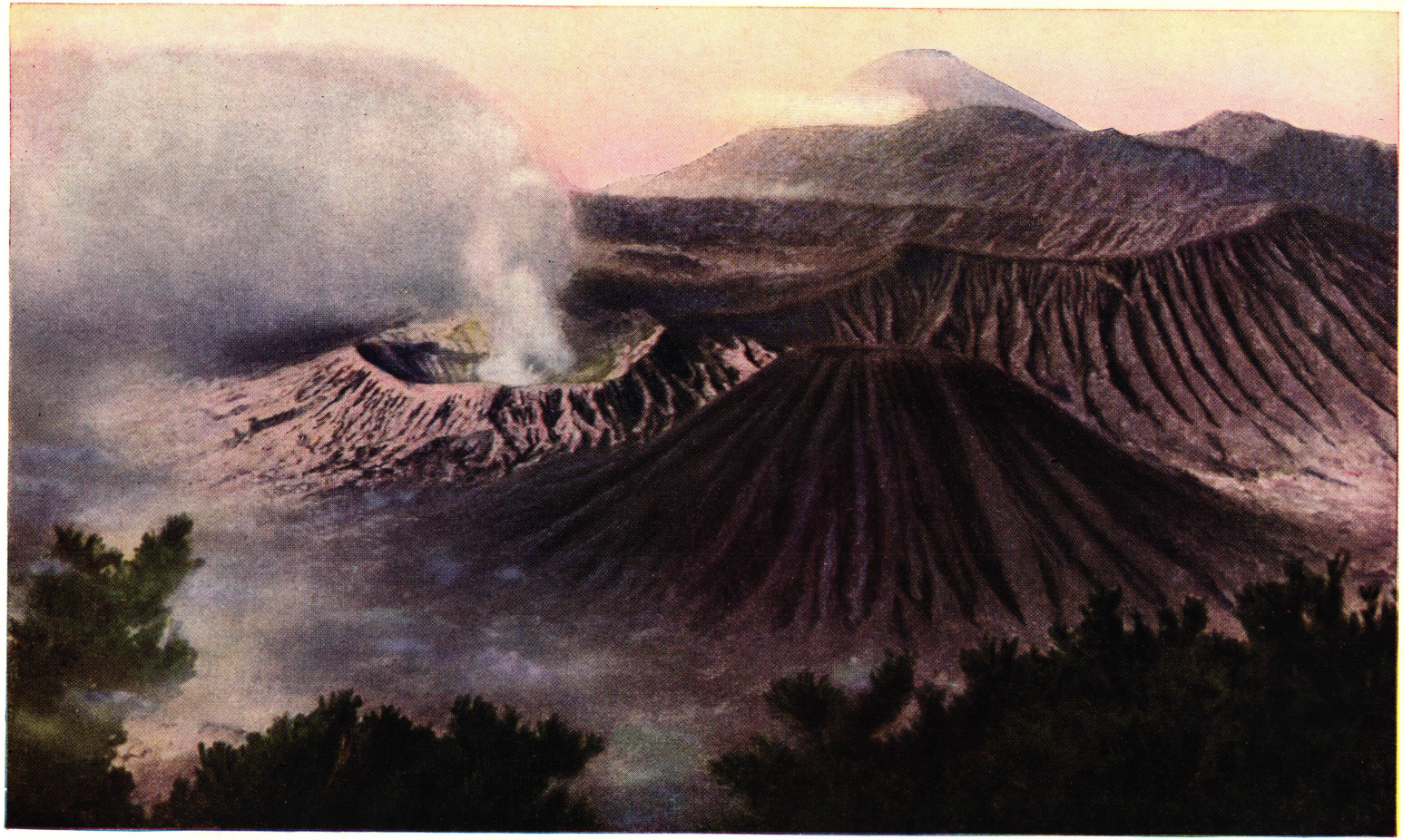
A volcano is generally shaped like a cone with the top cut off. This cone is gradually formed by the discharge of lava and rocks. In its centre there is a crater, at the bottom of which is the vent through which the lava flows. While a volcano is active this hole is kept open by the force of the vapors that it emits; but when the volcano remains quiet for some time the hole may become closed by rocks falling from the walls of the crater or by the hardening of the lava near by. Then when the volcano erupts again, a new crater may be made through some weak spot in the side of the mountain, so that it is never certain on what part of it the explosion will take place.

Stromboli, a volcano on the Lipari Islands in the Mediterranean, erupts at fairly regular intervals. In 1883 there was a disturbance at Krakatoa, an East Indian island, that seemed extraordinarily sudden, but was really the result of a state of unrest which had been going on below the surface of the earth for months or even years.

As men have learned more about the nature of volcanoes, it has become easier to interpret the signs by which a volcano gives warning of eruption. What are known as local earthquakes take place—tremors of the earth's surface that are confined to the volcano itself or the land near it. These earthquakes are often caused by a crack in the depths of the crater, such as would be formed by a rock giving way under severe strain. There have been a number of cases in which earthquakes have begun to occur years before the eruption took place. Earthquakes of this kind caused great damage in Herculaneum and Pompeii as much as sixteen years before the disastrous eruption of Mount Vesuvius, 79 A.D.

Other warnings given by volcanoes are roaring and rumbling sounds below the earth and the heating of the water in neighboring springs, which often rapidly decrease in volume at the same time. In the case of volcanoes capped with snow, the sudden heating of the crest of the mountain melts the snow and causes heavy avalanches.

Many eruptions have taken place without warning signs. This was the case with the terrible eruption of Mont Pelée, on the island of Martinique in the West Indies, which destroyed the town of St. Pierre and thirty thousand people. On the side of the mountain there is a great basin called Etang Sec in which the mud from the volcano mixed with water. On



© EWING GALLOWAY

THE ISLAND OF JAVA contains more active volcanoes for its size than any other place in the world to-day. In the above photograph, we see a group in the eastern part of the island. From the crater of Bromo, on the left, sulphurous wreaths of steam are issuing. A puff of vapor also rises from high Semeru in the background—another of Java's fourteen active volcanoes. Over a hundred craters are dormant. Some contain deep lakes, high under the sky. The soil is exceptionally fertile owing chiefly to the deep decay of the rocks, the abundant rainfall and the tropical climate.

EDWARDES

FUJIYAMA (Fuji), which we see rising above the mists of morning, is the sacred mountain of Japan, to which pilgrimages are made every summer. In 1707 its entire summit burst into flame, lava flowed and ashes fell even in Yedo (Tokyo), sixty miles away. Usually there are neither sulphuric exhalations nor bursts of steam, but it is not certainly extinct.

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SLEEPING VOLCANO THAT AWOKE AFTER A LONG REST

It will sometimes happen that a volcano thought to be extinct becomes active without warning. That was the case with Mount Tarawera in the geyser district of New Zealand's North Island. In 1886 it suddenly erupted with great fury, covering the country for miles around with mud and dirt, and killing over a hundred people.

May 5, 1902, the black, boiling mud escaped from the basin and poured with incredible rapidity down a gorge of the Rivière Blanche, carrying with it large masses of rock. Over the top of the mountain there appeared a dense cloud of suffocating gases, brown and purple, accompanied by quantities of volcanic dust. This dust seems to have been the cause of most of the harm, for it caused suffocation.

Sometimes an eruption happens beneath the sea. Most of the volcanic islands of the Pacific began in this way, reaching the surface either by a gradual upward growth through a number of upheavals or by a terrific explosion on the sea floor. Both Vesuvius and Ætna rose from the floor of the Mediterranean. Occasionally the effects of an eruption have been seen on the surface. Huge fountains of water play to a great height, and dead fishes and volcanic cinders are seen floating around. After a time a small island may rise above the sea level, and this is gradually enlarged by succeeding explosions.

The Hawaiian Islands began like this. They are really a chain of volcanic mountains, most of which have long been extinct; but the largest is still upbuilding itself. Mauna Loa now rises to 13,675 feet and every few years fresh outbursts add new lava to the mountain mass. An eruption that occurred in 1926 some five thousand feet below the summit sent a stream of melted rock thirty feet deep roaring into the sea in a cloud of steam. In 1790 Halemaúmau, the pit of four-thousand-foot Kilauea, below Mauna Loa, emitted a blast of ash so violent that it destroyed an Hawaiian army, then lay dormant until 1923, when a lake of fire appeared in the pit. Yet so thoroughly

is the conduct of these volcanoes understood that they have been made into the Hawaii National Park and tourists are encouraged to visit them.

Vapor is always the earliest effect of an eruption, and also the last, for it escapes even after the explosions have stopped. Then there is what is known as "electrical excitement," great displays of volcanic lightning, which flash through the vapor clouds. The actual discharge of the lava is often accompanied by volcanic rain formed by the steam from the eruption. The rain mingles with the dust and ashes and forms a torrent of mud, which rushes down the mountainside. The flames that attend the downward rush of the mud are generally the result of the hot ashes and mud flowing over vegetation which gradually begins to burn. Sometimes an eruption is accompanied by a tidal wave, as when in 1928 three villages on the coast of Flores in the Malay Archipelago were devastated.

Although the activities of volcanoes are so disastrous to the people who live near them, uses have been found for the substances which they produce. Many of the metals are of poor quality and of little use, but one important chemical, sulphur, is provided by eruptions. Yellow sulphur lines the crater at Popocatepetl in Mexico. There are small groups of so-called mud volcanoes of which the "paint-pots" of Yellowstone National Park are an illustration. These also occur in Iceland and to some extent in Java and Sicily. Hekla is Iceland's most wide-awake volcano. It is nothing to look at save a worn brown cone, with crevices, bare of all vegetation, set in the midst of plains of lava. In winter it wears a smooth mantle of snow. But it has been in eruption about thirty times to the knowledge of man. Iceland has been formed entirely by volcanic action. In fact, volcanoes have been active at some time or another in every part of the world.

BABY CRATERS IN THE MOUTH OF A GIANT VOLCANO

Haleakala, a ten-thousand-feet volcano on the Hawaiian island of Maui, is the largest extinct crater in the world. It covers an area of nineteen square miles and is in places several thousand feet deep. It contains hundreds of cinder cones like those shown above. Its neighbor, Mauna Loa, erupted in 1926, and Kilauea has been bubbling for a century.

© E. N. A.

ACROSS THE BAY OF NAPLES rise the twin summits of Vesuvius, a volcano still active. Until 79 A.D. no one dreamed that the gracefully sloping mountain by the sea was dangerous, and busy, populous towns, such as ill-fated Pompeii, were built close to its foot. Then one August day a black cloud arose from the mountain, accompanied by roars and rumbles; there was an explosion that blew off the mountain's top, and such quantities of cinders and ashes were expelled that Pompeii was buried twenty feet deep, as excavations have since disclosed.

SICILY'S MOUNT ETNA wrapped in its winter coat of snow, looks so peaceful that it is difficult to realize it is really a volcano with a core of eternal fire. Many times since history began Etna has laid waste the earth around it, destroying villages and even towns by its rivers of red hot lava, while the earthquakes that follow its convulsions take thousands of lives. The region around its base is densely inhabited. In the foreground we see the ruins of a Roman-restored Greek Theatre at Taormina (the ancient Tauromenium), now a popular winter resort.

Photograph from "The Great White South" by Herbert G. Ponting, F.R.G.S. Copyright

A "SMOKING MOUNTAIN" IN A LAND OF ICE: MOUNT EREBUS IN DISTANT SOUTH VICTORIA LAND

The volumes of steam and sulphurous gas that continually pour from the crater of 13,300-foot Mount Erebus in the Antarctic show that there is fiery heat beneath the ice and snow that cover the sides of the mountain. Yet the explorers of the Shackleton Expedition who reached its summit in March, 1908, found that, with the temperature 50 degrees below zero, there lay an active crater nine hundred feet deep, visible only at rare intervals because of the steam which hung in a cloud for a thousand feet above the summit of the high mountain.

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SPELLING GEOGRAPHICAL NAMES

The spelling of geographical names has always shown much variation. One who studies atlases and reads books of travel may find the same name spelled in a half dozen or more different ways, though all apparently come from the same root word; or may find two or more entirely different names which evidently refer to the same place. Many of the European names most familiar to us are spelled differently by the inhabitants of the city, or country, and by the outside world. French influence has been very strong. The Italians themselves say Roma, Firenze and Napoli, but we use the French forms Rome, Florence and Naples. The Germans say Köln but we use the French form Cologne. There are many other similar instances. We say Italy, the French Italie, but the Italians themselves, Italia. We write Prussia, the French Prusse, but the Germans write it Preussen. We say Spain, the French Espagne, but the inhabitants say España. Again, we say Genoa, the French Gênes, but the Italians call the city Genova. The Austrians say Wien, the French Vienne, while we say Vienna. The French say Anvers, the Flemings Antwerpen, which we shorten to Antwerp. There are hundreds of similar differences to be found upon the map of Europe.

Another great cause of difference is the difficulty of transliteration. While most of the languages of Western Europe which have spread over the Americas have the same, or almost the same alphabets each has some sounds which are difficult to express in another language. Moreover, some of the letters are pronounced differently in different languages, and the rules for the silent letters and the pronunciation of double letters are different.

These difficulties are small, however, when compared with the differences in the alphabets used in Eastern Europe, Asia and Africa. There are many cases here where our English does not have the same sounds found in these alphabets, and we can only approximate them. For example you will see both Romanov and Romanoff as the name of the old Russian royal family, also Kiev and Kieff. The actual Russian sound is neither "v" nor "ff."

Since the World War there have been thousands of changes. Several nationalities which had been under foreign rule, when they gained their independence, made a clean sweep of the place names which had been used by their rulers, or else changed the spelling. Prague became Praha; Pressburg became Bratislava; Helsingfors became Helsinki; Belgrade became Beograd; Monastir became Bitolj; to cite only a few examples. In other cases countries already independent have shown a tendency to revert to archaic forms of names which showed foreign influence.

ALPHABETICAL INDEX

In this index the figures in bold type indicate volume numbers, those in light type refer to page numbers. A single star before a page number marks an illustration; two stars are placed before color-plates. The repetition of a page number, first without a star and then with a star, shows that there is an illustration on the page, in addition to an important text reference.

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